

# The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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## Notes and Comments

### Organisation of Manufacture

GOVERNMENT intervention in industry was strongly deprecated by Sir Harry McGowan, chairman of Imperial Chemical Industries, Ltd., in an address on the organisation of manufacture at the National Liberal Club on November 29. His idea of a new organisation of industry is one governed rather by the ideals of co-operation than the struggles of competition. Although, as Sir Harry pointed out, industry is conducted under our present system for purposes of private gain, it still remains a public service, and its ideal is the satisfaction of the community's needs in the most economic and efficient manner. The world is shrinking under the advance of science and as the association between peoples becomes more intimate there is greater need for order and reason. Sir Harry believes that industry, like every other human activity, will ultimately find its fullest liberty in the voluntary restraint from which all true co-operation springs.

No industry in a condition of reasonable prosperity has yet embarked upon self-government and at the same time managed to secure, on the one hand, the avoidance of over expansion and, on the other hand, a satisfactory infusion of new ideas and new blood. In some countries on the Continent and also in the United States, new organisation has developed far beyond the point reached in this country. Experiments carried to extreme are always dangerous in that they make it difficult to proceed with caution and examine every advance in the light of experience. The code system in the United States has been forced too rapidly and too extensively, with the result that where there should be order there is only confusion. We agree with Sir Harry McGowan that it would be doubtful wisdom for Great Britain to adopt any general plan to be applied to different industries without consideration of the characteristics of various classes of industry.

### Intermediates on the Free List

THE Treasury, as reported in THE CHEMICAL AGE last week, has issued an order putting into effect a recommendation of the Import Duties Advisory Committee to place 122 organic intermediate products or mixtures of organic intermediate products used for dyestuffs on the free list. In its report on dyestuffs the Import Duties Advisory Committee, after defining the dyestuffs which it proposed should be added to the free list, stated that there were certain special cases of intermediates with which it might have to deal by

recommending their addition to the free list specifically. The committee received representations with regard to certain series of organic intermediate products which are chiefly, if not exclusively, used by dyers in the production of dyestuffs on the fibre. Though technically not dyestuffs they are in the nature of dyestuffs. Equally with dyestuffs they are subject to the control instituted by the Dyestuffs (Import Regulation) Acts, 1920 to 1934, and the issue of licences for their importation is governed by the same principles in both cases.

It was at first represented to the committee that all intermediate products used for the production of dyestuffs on the fibre should be added to the free list, but the committee could not assent to this proposal owing to the interests of British producers and the technical difficulties in the way of devising an exact definition of the articles to be included in any order that might be made. The committee, however, expressed its willingness to examine the list of specified products the addition of which to the free list would meet with the approval of both the consuming and the manufacturing interests. Such is the list covered by the new order. It has been prepared by the joint consultative committee set up by the industries concerned in accordance with the suggestion in the dyestuffs report submitted early in the year. There are still a number of intermediates not in the list which are likely to be the subject of disagreement between the colour users and the makers, but for the moment there is a sense of satisfaction on the part of the dyestuff users in having received part of their demands.

### Reclaiming "Waste" Rubber

THOUSANDS—probably millions—of worn tyres are lying about the country, occupying valuable space in garages and yards or disfiguring the countryside, because their owners have not yet found a satisfactory method of disposal. Rubber hot water bottles that no longer hold water, rubber shoes and goloshes that are past wear, are also reposing uselessly among the "waste" of modern civilisation. Yet for a quarter of a century or more the rubber reclaiming industry has been at work converting such articles into "reclaim" rubber, a valuable commodity which with improving technique is being used in increasing percentages for mixing with crude rubber. Elsewhere in this issue we publish an illustrated article on the operations at one of the most up-to-date regenerating factories in the United Kingdom. Some method is needed by which the rubber regenerating concerns can maintain a regular

and steady contact with the sources of these "raw materials" of their industry. A hot water bottle, a rubber shoe or a tyre is by no means used up when it has passed its useful lifetime. Anything from 70 to 99 per cent. of its substance still remains good rubber, and it would not surprise us to find one day some enterprising company concerning itself solely with the collection of such goods for sale to the producers of reclaim rubber. Generally speaking the material could be obtained free of charge—the owners would be thankful to get rid of it—but regular collection and transport would need skilful planning to make the business profitable. We do not know the ruling price paid by the regenerating companies but we do not know that, except for a few isolated cases, they have no substantial regular source of supply, and it is reasonable to assume that if someone could offer them a steady flow of "raw materials" all the year round they would be prepared to pay a figure which would make the business worth while.

### **Posts Abroad**

THE problem facing a man who is offered a post abroad is not infrequently a serious one, and one, moreover, of which the seriousness is not always fully appreciated. Where a man is sent abroad by an English company with the full knowledge that after a space of work overseas there is an assured place for him at home, the problem is almost solely one of medical fitness. The instances to which reference is made are those where there is no such assurance. Either the man must resolve to live abroad for the rest of his life, and if the post be sufficiently good and his employment adequately sound there is no reason why he should not do so, or he must expect to come home again when his term of agreement ends. Those who have a sufficiently good post to go to, have little problem to face other than the personal one of permanently leaving home. Some older men, and nearly all younger men, however, will be asked to sign on for a period of years at a salary or under conditions which preclude any likelihood that they will stay there for longer than their agreement insists. The problem of coming home presents for them no terrors.

Experience shows, however, that the home-coming problem is very real and that it is extremely difficult to obtain an adequate post in England after service abroad. One difficulty is that the wanderer is forgotten; "out of sight, out of mind" is very true, and those people to whom one could look for that little grain of "influence" which makes the difference when applying for a post, have forgotten, or have lost their enthusiasm to help. An even worse difficulty is that unless the sojourn abroad has been very short, practice in England will have changed so much that the returned wanderer will be "out of it." Those thinking of going abroad should take these facts very carefully into account before making up their minds.

### **Training a Successor**

IF these circumstances must give pause when accepting a normal post abroad, what must be the attitude towards a post such as that advertised by the Director of Recruitment (Colonial Service) for a chemist in the Archaeological Museum in Palestine? Here some two or four years' employment are foreshadowed, but at the

end of that time the agreement terminates with no suggestion that another post will be found, it being specifically stated that the selected candidate "will be required to train a Palestinian officer to succeed him when his contract expires." We should require a post such as this to be pensionable before undertaking it!

This raises another question, the general one of a good man working for the best years of his life—whether at home or abroad—and then being displaced by a younger man. All men must grow old. When that time comes, however we may grudge it, a younger man must take our place; it is sad, but the penalty of life. When the year of retirement comes the blow should be softened first by fixing a standard age for retiring so that retirement comes automatically and leaves behind no sting of being "asked to go," and in addition the retiring servant should be pensioned. The pension is a debatable point. Many there are who maintain that a man should save for his old age, and that is undoubtedly true. It is one of those roots of hardy Anglo-Saxon independence that each should fend for himself; but that, in its turn, presupposes that the salary paid has been adequate to allow saving. All too often it happens that those who are loudest in their insistence that each should fend for himself are those who pay the smallest salary possible. Before an old man is retired, inquiry should be made as to his financial position. If real hardship is entailed by retirement, a half-way house may possibly be found, by partial retirement subject to training a successor.

### **A Check on Efficiency**

THE question of training a successor is difficult. Every junior is a potential successor; and many seniors, alas, treat them as such and encourage them not at all. When a man retires or dies, leaving behind no one who can carry on where he left off, the firm suffers, but firms will not get men to train their successors unless they give adequate safeguards that the successor will not be promoted until the retiring age is reached and that when that age is attained, there will be proper safeguards against unfair treatment of a faithful servant who has grown too old to fulfil his duties. There is very much to be said for independence, but when age begins to show itself, independence is impossible without a bank balance. This is a very real fear among employees, and particularly staff employees, and employers would do well to institute some system of insurance and pensions—compulsory, if need be—to relieve this undoubted check upon departmental efficiency.

### **The Poison Rules**

UNDER the existing Poison Rules, only registered pharmacists and Fellows and Associates of the Institute of Chemistry are recognised as persons qualified to supervise the manufacture of pharmaceutical preparations containing poisons. The British Association of Chemists is strongly of the opinion that members of the Association should also be included in this category, and in support of that contention the committee of the Poisons Board has been supplied with full particulars regarding the Association and the regulations governing admission to full membership—a status which implies complete qualification and is a guarantee of competency in chemical practice.

# A Standard Basis for Thermochemical Calculations

## International Commission Issues its First Report

IT was in April, 1933, that the Standing Commission for Thermochemistry, Union Internationale de Chimie, decided to publish periodically reports upon thermochemical researches of a general character. It was agreed at the same time to publish at intervals summaries upon the numerical data which are indispensable for carrying out thermochemical calculations. The first report, which has now been published, deals with the determination of the heat of combustion of substances containing the elements C, H, O and N; it covers units, thermochemical standards, calibration of bomb calorimeters by means of benzoic acid, control of the purity of oxygen, thermometric corrections, preparation of the substance for combustion, actual measurements, isothermal correction, correction for the heat of combustion under the constant pressure of one atmosphere, and numerical data to publish. The English translation is by Mr. L. Keffler, of Liverpool.

### Physical Constants

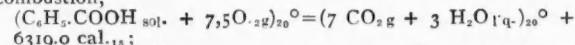
In principle, states the report, it would be desirable that all physical constants should be expressed in C.G.S. units. The adoption of the absolute joule as the primary unit of energy is, however, complicated by the simultaneous existence of the international joule. Until the absolute joule can be recommended for practical use, the Commission proposes to adopt provisionally as the most probable value for the heat of combustion per gram of benzoic acid (in vacuo): 26.434 intern. joules, this value referring to an isothermal reaction at the temperature of 20° C. In collaboration with the Bureau International des Poids et Mesures (Sèvres), the Bureau of Standards (Washington), the National Physical Laboratory (Teddington) and the Physikalisch-Technische Reichsanstalt (Charlottenburg), it has been decided to preserve provisionally as the conventional unit the cal.<sub>15</sub>, and to adopt for this unit the value 4,1833 intern. joules, which gives for the heat of combustion of benzoic acid the provisional value of 6319.0 cal.<sub>15</sub> (in vacuo). In order to convert into absolute joules any data expressed in terms of calories, the Commission recommends to use provisionally the conversion factor:

$$1 \text{ cal.}_{15} = 4.185 \text{ abs. joules.}$$

For any thermochemical measurement, in particular for the determination of heats of combustion, certain corrections are required, the number of which is nearly always large. When the calibration of the calorimeter is carried out by burning in the bomb a standard substance under conditions identical with those which will characterise later on the combustion of the substance investigated, many of these corrections are eliminated automatically. For the present the Commission has adopted two standard substances in connection with the determination of heats of combustion: (1) Benzoic acid, for the determination of the heats of combustion of solid and liquid substances (by means of the bomb) and (2) hydrogen, for the determination of the heats of combustion of gases and vapours or volatile liquids (by means of the flame calorimeter).

### Heat of Combustion

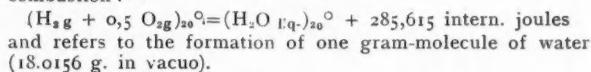
As the result of an international agreement, the value accepted for the isothermal heat of combustion, at the temperature of 20° C., per gram of benzoic acid weighed in vacuo, is 6319.0 cal.<sub>15</sub>. This value refers to the equation of combustion,



and it corresponds to a pressure of 30 atm. in the bomb and to the introduction in the latter of a mass of water equal to 3 g. per litre of capacity of the bomb. It is further understood that one should use for the combustion a mass of benzoic acid amounting to approximately 3 g. per litre of capacity of the bomb. The variations allowed for these three quantities are respectively: 1 atm.; 0.5 g. and 0.3 g. per litre of capacity of the bomb.

For the heat of combustion of one gram-molecule of gaseous hydrogen (burnt at the temperature of 20° C., under

a constant pressure of one atmosphere, the product of the combustion being liquid water) the Commission has accepted the value: 68,351 cal.<sub>15</sub> (obtained by Rossini, at the Bureau of Standards). This value corresponds to the equation of combustion:—



### Calibration of Bomb Calorimeters

In order to avoid a lack of homogeneity in the results obtained from measurements of heats of combustion, the Commission considers that all the calorimeters which are used for the determination of the heats of combustion of either pure substances or fuels should be calibrated by means of one or the other of the two substances selected as standards as the case may be. The additive method of calibration is not compatible with measurements of high precision and should be completely abandoned. The electrical method of calibration, on the other hand, can only be allowed in the exceptional case where it is desired to control the value for the heat of combustion of the standard itself.

The preparation of standard benzoic acid should not be subjected by the investigator to any treatment other than a mere drying. In view, however, of the fact that, in extreme cases, the amount of moisture absorbed by benzoic acid may cause variations of the order of nearly 0.1 per cent. in the heat of combustion of the standard substance, it is a safe precaution to control the first calibration by using the same preparation of benzoic acid, after having subjected it previously to fusion at a temperature kept below 140° C. and, if possible, not higher than 130° C. Furthermore, the heating of the substance ought to be stopped as soon as the fusion is complete. In order to preserve a sample of standard benzoic acid, it is well to enclose it in a bottle having a well-fitting ground stopper and itself enclosed in an exsiccator containing some phosphoric anhydride which should be renewed at sufficiently short intervals.

### An Essential Condition

The essential condition by which the calibration should be governed consists in carrying it out in such a way that all the factors upon which it depends remain identical to themselves for the successive combustions; these should include all those to be carried out later on with the substances under investigation. There should be fixed (1) the mass of benzoic acid to be burnt and also the mass of auxiliary substance required for ignition; (2) the mass of water introduced into the bomb; (3) the mass of oxygen introduced per litre of capacity of the bomb, or what comes to the same thing, the pressure under which the oxygen is introduced into the bomb; (4) the initial temperature of the combustion; (5) the increase of temperature produced by the combustion; (6) the length and diameter of the platinum wire used for igniting the charge in the crucible; (7) the intensity, voltage and duration of the ignition current; (8) the length of the mercury thread protruding outside the calorimeter, or the intensity of the current traversing the platinum wire according to whether a mercury-in-glass or a platinum resistance thermometer is used; (9) the number of revolutions of the stirrer per time unit; (10) the formula by means of which it is proposed to calculate the correction for heat transfer between the calorimeter and its surroundings (*e.g.*, the Regnault-Pfaundler-formula, the graphical method or the integration method by means of the slide-rule, as proposed by W. Roth); (11) the method adopted for the determination of the nitric acid formed during the combustion; (12) the technique followed for verifying that the combustion was complete; and (13) the method used for controlling the outside temperature, either for keeping it at a fixed value or at least in order to maintain it within sufficiently narrow limits so that the correction for the emergent stem of the thermometer be small or nil. If the temperature varies between wide limits throughout the year, and can only be controlled with difficulty, it is

advisable to select several initial temperatures and to carry out as many different calibrations as there are intervals of temperature defined by these initial temperatures selected.

For the determination of heats of combustion, the Commission recommends (a) weighing the quantities of substances to be burnt within a tenth of a milligram or less; (b) weighing the calorimetric fluid within one decigram; (c) measuring the volume of the water in the bomb within a hundredth of a c.c.; (d) measuring the pressure of oxygen within 5 per cent.; (e) reading the thermometer immersed in the calorimeter to the nearest thousandth of a degree; (f) fixing the initial temperature of the combustion, for the whole series of measurements to the nearest hundredth of one degree; (g) fixing the increase of temperature within 2 hundredths of one degree; (h) keeping the number of revolutions of the stirrer constant within 5 per cent.; and (i) limiting the magnitude of the Joule effect in the ignition wire to 0.2 cal. at the most.

### Control of Purity of Oxygen

Numerous observations made with the bomb have shown that compressed oxygen, either from electrolytic or from atmospheric sources, is nearly always contaminated with traces of combustible impurities. Hence, before proceeding to the calibration of a calorimeter, it is necessary to verify whether the oxygen which is available is sufficiently pure. Since these combustible impurities are usually present only in very minute traces, a control of the purity by way of an ordinary chemical analysis is not sufficiently sensitive.

One may carry out a preliminary calibration of the calorimetric system by selecting for the successive combustions widely different pressures for the oxygen contained in the bomb, such as for example 15 and 35 atmospheres. The other factors governing the combustion are maintained as constant as possible; in particular, the same substance (preferably benzoic acid) and the same amount of that substance should be used in every case. In order to avoid the risk of incomplete combustion at lower pressures, the amount of the substance used should not be more than half the amount normally employed for a combustion of calibration. If it was observed at higher pressures that the increase of temperature was larger than at the lower ones, all other factors being equal, it would mean that the oxygen tested was impure and should be rejected; otherwise one would obtain for the water equivalent values which would be the lower, the larger the combustible impurity content of the oxygen. If on the other hand the values found for the water equivalent, after being referred to the same pressure, were identical amongst themselves within the limits of the accidental error, one would conclude that the oxygen was sufficiently pure and proceed with the actual calibration without taking into account in the final result the values obtained by means of the preliminary calibration (since these were characterised by different conditions).

### Thermometric Corrections

Alternatively, when the water equivalent of the calorimeter is already known it is sufficient to carry out some combustions with standard benzoic acid under the normal conditions, namely as regards the mass of substance and the pressure in the bomb, using the oxygen to be employed for the combustions. If the mean value obtained in this manner is identical, within the limits of the experimental error, with the known value for the water equivalent, it is a proof that the oxygen under test is sufficiently pure. If the new value differs from the earlier one by 2 or 3 calories only, the former may be accepted as representing approximately the water equivalent and serve as such for the duration of the cylinder containing that particular oxygen. If, however, a precision as high as 0.02 per cent. is aimed at, it is well to verify that the water equivalent has not undergone an apparent change, before the cylinder is exhausted.

The oxygen may also be purified by passing it very slowly under pressure through a layer of red-hot palladised asbestos inside a thick-walled copper or nickel tube. This method gives the best results, but it has the disadvantage of being slow and tedious; it is not very suitable when long series of measurements are contemplated, but is very useful for fixing with a maximum accuracy the value for the true water equivalent of a calorimetric system.

Any measurement of a temperature interval requires the introduction of a large number of thermometric corrections.

If the combustion of the substance investigated be carried out under exactly the same conditions as those which characterised the combustion of the standard substance, these corrections may be neglected since the correction for the hydrogen scale is included. The only correction necessary is that for the emergent stem of a mercury-in-glass thermometer; this correction depends upon the temperature of the surroundings.

### Preparation of Substance for Combustion

The preparation of a substance to be used for the determination of its heat of combustion by means of the bomb is one of the most important problems which have to be solved when thermochemical measurements are being considered. Indeed, the technique for the determination of the heat of combustion has been so much improved that one should *a priori* eliminate the determination of the heat of combustion of a substance for which the method of preparation and the degree of purity have not been thoroughly investigated. Neither a chemical analysis nor any of the other methods which are used to determine the degree of contamination of a pure substance can be considered as sensitive enough for testing whether the substance is sufficiently pure for combustion.

The Commission considers that the methods of preparation, purification and control of the purity should be described with sufficient details in order to allow of exact reproduction if need be. In particular, the solvent used for recrystallising the substance plays an important rôle. Since it is sometimes impossible to eliminate completely the last traces of solvent, the use, whenever possible, of a solvent having a heat of combustion in the immediate neighbourhood of that for the substance itself is recommended. On the other hand it is essential to make use of two and preferably of several specimens of the substance, which have either been prepared or purified by different methods. Furthermore it is desirable to quote the values obtained for the less pure specimens (contaminated with solvent residues, moisture, etc.) as well as those obtained for the purest samples. This procedure will generally supply important information about the extent to which these various contaminations influence the heat of combustion. In cases where the substance is purified by distillation, or by crystallisation, it is very useful to determine the heat of combustion of a series of fractions characterised by boiling or melting points in the neighbourhood of those which correspond to the purest fractions.

### Preliminary Studies

Before starting to carry out measurements, it is important to study the substance from the point of view of its hygroscopicity and its adsorption and absorption power for oxygen under the pressure used for the combustions. Useful information can also be obtained by carrying out control experiments under conditions which are as similar as possible to those to be used in connection with the thermochemical measurements themselves. For example, it is interesting to determine the variation in weight of the substance (in the same state as for the combustions) when left to stand in the bomb (containing the usual amount of water and of oxygen) during a time interval fixed by the technique to be employed. If the variation in weight is found to be appreciable, it will be worth while to calculate a corrective term for the heat of adsorption.

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IN a survey of oxygenated industrial chemicals in the "Chemiker-Zeitung," November 21, Dr. K. Segsteller points out that hydrogen peroxide is now mainly produced from persulphuric acid or its salts and salt solutions. Three principal modifications are now in industrial use. The Weissensteiner process is based upon direct vacuum distillation of persulphuric acid which is then split up into hydrogen peroxide and sulphuric acid. Ammonium persulphate is utilised in the process of Pietzsch and Adolf. This is converted to the potassium salt which in turn reacts with sulphuric acid in the presence of water vapour in vacuum when hydrogen peroxide and potassium bisulphite are formed. Finally, the latest process, also based upon ammonium persulphate, involves electrolytic formation of the salt and its decomposition into ammonium bisulphite and hydrogen peroxide by vacuum distillation in a special apparatus.

# La Maison de la Chimie Inaugurated

**T**HE Maison de la Chimie, in Paris, was formally opened on December 1, in the presence of the President of the Republic and a considerable international gathering of chemical talent. All the proceedings, including the final banquet—cooked on the premises—to perhaps 400 persons, were held in the Maison: on so liberal a scale it is constructed. The meeting began with a reception, held on the evening before the day of opening. The time was mainly spent in the large theatre, listening to a varied, highly-finished entertainment by leading artistes from the National Opera House and the Comédie Française, the music being under the direction of M. J. E. Szfyer, Chef d'Orchestre at the Opera. Instrumental music was interspersed with acting, dance and song. Needless to say, the programme was of high artistic merit. Following modern practice, not a few then indulged in barbaric gyrations to strange noises—to show perhaps that the operations of the Maison may range from the sublime to the ridiculous and so mark the contrast between scientific and ordinary practice. Of course, we assume that everything done was symbolic.

### A Solemn Sitting

The formal inauguration took place on the Saturday afternoon. The ceremony was honoured by the presence of the President of the Republic but otherwise he took no part in it. Various grave and reverend Signors were seated at a long table upon the stage, in face of the audience, the President being in a box at the back of the parterre. M. André Malarmé, Minister of Education, occupied the chair. Addresses were solemnly read by M. Behal, president of the Administrative Council; M. L. Vallenilla Lanz, Venezuelan Minister in Paris, Venezuela being the chief contributing country; M. Biilmann, late president of the International Union of Chemistry; Sir Robert Mond, a large donor to the building fund; finally, by M. Mallarmé. The ceremony was appropriately described as a solemn sitting: except for a glint of humour in the Dane's eye, Professor Parravano's was the only smiling countenance. The official element was strangely serious as a whole. French oratory, sad to say, is no more: we made the observation seven years ago at the Berthelot centenary celebrations: it is engulfed in the mechanism of the microphone. Of course, everybody congratulated everybody and the pious hopes current on all such occasions were in due circulation. We may know but are strangely deficient in the art of using our knowledge with public effect. The result was as it would be here: the Press took no particular notice.

### The only English Speaker

In the evening, delegates were entertained at dinner by the Fédération Nationale des Associations de Chimie de France, in a delightfully cosy small banqueting hall. If the chemists in the service of the Maison can provide a chemistry as good as the cookery provided by the kitchen staff, the authorities will have good cause to congratulate themselves. After the chairman, Professor Delepine, had delivered an opening, informative address, no less than sixteen foreign delegates were put up to deliver "allocutions." However, the atmosphere was congenial; the audience respectfully attentive: so we got through the ordeal with unusual despatch. Again, excepting Professor Fichte, of Basle, who is noted for his cheeriness, speakers took themselves very seriously. The thought came to us that Professor Polanyi, in his appointment to come, may find lucrative occupation, away from Manchunium in the long vacation, in giving elocution demonstrations at the Maison: his teaching might initiate a retreat from the microphone. At these banquets we really do want an international comic actor or two among us. Professor Cohen bravely attempts the part but is too gentle in his touch—it takes broad acting to get through scientific dullness and lack of imagination. All united in good wishes to the Maison, as they well might, in view of the remarkable facilities it will offer to all scientific visitors to Paris. The only English speaker listed was Professor H. E. Armstrong, described as Doyen de la Royal Society, Délégué du Federal Council of Chemistry. Whether he spoke as Doyen or as

### An International Centre which Meets a Paramount Need

Federalist is not clear; he is shockingly capable of anything, according to his "friends." We have learnt that he spoke as follows:

"On November 30, 1927, at the Royal Society of Arts, London, in presence of the French Ambassador, who occupied the chair, I gave an address on 'Marcellin Berthelot and Synthetic Chemistry—a Study and an Interpretation.' In conclusion I said 'The least we can do, in acknowledgment of the immense debt industry owes to him for his services to synthetic science, is to recognise the greatness of his achievements: in our memory, ever rank him among the famous men of chemistry.' Seven years later, to a day, we meet here in this Centre Marcellin Berthelot da la Maison de la Chimie, in Paris, to celebrate the completion of a great memorial to his memory. Himself he would have wished to see a place of action—no mere effigy in stone or bronze.

"La Maison de la Chimie—aujourd'hui—c'est un grand fait accompli! Un grand fait! A great constructive work.

"English chemists can appreciate it the more, because, as yet, we have failed to do a like work—even to persuade ourselves that we ought all to live under one roof. You have not only had imagination yourselves but have made many others your enthusiastic helpers. What is more, you have carried your Government with you. You have learnt how to appeal to your Government. We have not. We envy you. Therefore we can congratulate you the more heartily.

"Many will have taken active parts in bringing the great task to completion but one master mind stands out, as indefatigable leader—notre cher ami, Jean Gerard! I am here specially to give expression to the admiration those of us have of his work who have followed his career.

### Memory of Berthelot

"Je voudrais vous embrasser, cher ami Gerard. Over a long period, in connection with the Union Internationale de Chimie and the French Society of Chemical Industry, you have ever been to the fore and have won your way through all obstacles. We cannot rate too high the service you have rendered; we cannot thank you too warmly. But who discovered you, Jean Gerard? I believe Paul Kestner. We much regret that he is not with us to-day. I trust he will learn that we have thought of him.

"We also regret to-day the very recent loss of M. Philippe Berthelot, the distinguished youngest son of the man to whose memory this house is dedicated. I note you have made provision of Les Cuisines on a grand scale and we have good evidence to-day that this department is already highly effective. Cookery, it has been said, counts before kissing; certainly before documentation. Cookery, in future, must be synonymous with chemistry: it must mean proper food. I hope you will be a branch of our Wine and Food Society, which is seeking to make French wines better known in England—but we want them sulphurless. The Maison also enshrines the memory of a long line of French heroes—Lavoisier, Gay Lussac, Biot, Regnault, Chevreul, Pelouze, Balard, Dumas, Laurent and Gerhardt, Claude Bernard, Wurtz, Pasteur, Schutzenberger, Friedel, Le Bel, Haller, Moissan, Curie, Moureu....

"The building is to be an International Centre, as well as a focus point for French chemistry. You are meeting the need that is paramount to-day among scientific workers of all countries to come together and take counsel how best they may aid in bringing the spirit of fraternity, which exists among themselves, to bear upon the nations to which they belong. They have to carry knowledge to the people. Only ignorance promotes strife. When we dispute among ourselves, it is over our ignorance. We English have given a portrait of Davy to your collection. Davy's work was so honoured in France by Napoleon Bonaparte that he was allowed to come to Paris with Faraday and to travel through

France to Italy when our two countries were at war. No ruler since Bonaparte has paid such high honour to scientific ability. The Maison may well help to develop the spirit shown by Napoleon, by making known the outstanding public value of Chemistry—that it is the basis of our modern civilisation.

"To-day, all countries are in the gravest economic peril. They can only escape if they make fullest use of the methods of the scientific worker. You will need, in the first instance, to use the Maison in the service of France, to promote a complete and effective union of French chemists. Documentation will be of small importance in comparison with this task. You must help, if possible, to reduce the mass of worthless publication—not give it encouragement. The great task before us to-day is to produce great men. We have only to think of the work done by the one Englishman, Faraday; by the one German, Liebig; by the one Frenchman, Pasteur. In effect, these three men both govern and save the world to-day. France led the way in introducing philosophy into chemistry, at a time of national, civil revolution. To-day, at a time of world chaos, she is again leading, by seeking to promote fraternity among those who are striving to carry the peace of understanding to all men. May her efforts be hallored!"

On the Sunday, delegates were entertained at a great banquet of at least 400 persons, again in the Maison. The only speakers were M. Behal, M. Parravano and the Minister of War, General Maurin. A fairly full description of the building was given in a special October number of "Chimie et Industrie." The site was given by the Government,

together with a fine old mansion formerly held by the Count of Auvergne. This house has been reconstructed and restored but is left unimpaired in style; its rooms will serve as conference chambers, both large and small. To this house has been added the Cercle Marcellin Berthelot, a large ultra-modern building, providing conference accommodation on a grand scale, together with an extensive section for documentary work. Even the kitchens are constructed on a sufficient scale to provide dinners for up to five hundred persons. This new building reeks of mechanism but apparently there is no means of opening a window nor can a pin be stuck in anywhere. The air is ozonised but to us it seemed to lack oxygen. To work happily in such severe office surroundings will not be easy. It is fortunate that the rare beauty of former days is preserved in the restored section of the Maison: there the eye will find solace. Already, various countries have contributed portraits of chemists of old renown which are hung in the rooms. Our English contribution is a fine copy of the Royal Society portrait of Sir Humphry Davy. The building is in no way to be reserved for the use of chemists. The facilities it affords for conference meetings will be at general disposal. Already, the rooms have been let for meetings up to dates well on in the earlier part of the coming year. The Maison will in this way secure a considerable income. A number of the French Chemical Societies are already associated in the building: their example is likely to spread. Undoubtedly, a magnificent shell has been provided: the use made of it must depend on the men who will rise to its service. Their task will not be an easy one.

## Imported Salts : Board of Trade Inquiry

### Proposed Marking under Merchandise Marks Act

THE Standing Committee appointed by the Board of Trade under Part II of the Merchandise Marks Act, 1926, conducted an inquiry on December 3 and 4, at the Westminster offices of the Board, into an application for a marking Order in respect of all imported salt, including blends and mixtures, the marks of origin to be applied to the sacks, bags, casks, cartons or other containers. Sir Hubert Llewellyn Smith is chairman of the committee.

The promoters of the application were the Salt Manufacturers' Association, comprising the Salt Union, John Garner and Co., Ingram Thompson and Sons, Alfred J. Thompson, Chance and Hunt, Ltd., I.C.I. (General Chemicals), Ltd., and Henry Seddon and Sons, Ltd. These firms claimed to be responsible for the greater part of the salt manufacture of the United Kingdom. Outside the Association, Geo. Hamlett and Sons, Ltd., Middlewich Salt Co., Ltd., Verdin Cook and Co., Ltd., Manger's Salt Works, Ltd., Charles Moore and Co., Ltd., British Soda Co., Ltd., Palmer Mann and Co., Ltd. (managers for Cheshire United Salt Co., Ltd.), Agden Salt Works, Ltd., Cerebos, Ltd., New Cheshire Salt Works, Ltd., Cleveland Salt Co., Ltd., and Manx Salt and Alkali Co., Ltd., supported the application.

Opposition was made by the Federation of Grocers' Associations of the United Kingdom and associated bodies; by F. W. Berk and Co., Ltd., Frank Agnew, Ltd. (Glasgow), and Hugo Knoblauch and Co., Ltd. (Leith), who are importers; by the Mediterranean salt group, comprising Western Bros., Ltd., George Couper and Co., Ltd., the North Pole Ice Co., Ltd., and J. C. Peacock and Co., Ltd., and by the British Herring Trade Association, Ltd.

In their statement of case, the applicants stated that the production of salt in the United Kingdom in 1932 was 692,000 tons; the imports in 1932 and 1933 were 52,000 and 49,000 tons respectively. In the absence of a mark of origin, it was impossible for many purchasers to know whether they were buying British or imported salt. It was believed that local authorities in particular wished to buy British, and it was asked that imported salt should bear marks of origin at the time of importation as well as at the time of sale or exposure for sale, because a Sale Order alone would not be fully effective. It was not always possible for a manufacturing expert

or chemist to tell the origin of salt either by appearance or by chemical examination. Moreover, it was not to be assumed that unmarked salt was imported, as a considerable quantity of salt of United Kingdom manufacture was sold in containers bearing no marks of any kind.

It was claimed by the grocers that imported salt was not a serious competitor of home produced salt. According to the applicants' own figures, for every 13 tons of home-produced salt, in 1932, less than one ton was imported; in 1933, the imports had fallen by 3,000 tons, so that presumably the disparity between the home-produced and imported quantities was still wider. There was no evidence that any consumers ever asked for British salt, or had any inclination either way; they decided entirely on price and quality, having regard to its use. The absence of an Order so far had not been prejudicial to the sale of home-produced salt.

Mr. R. D. Hodges (secretary, Salt Manufacturers' Association) contested the statement made by some of the opponents that a marking Order was not necessary, and that imported salt was not sold as British.

Mr. B. Carrick (London manager of the Salt Union), gave evidence in support of the application. He said that shopkeepers and others were buying foreign salt, under the impression that it was British, whereas many, had they been aware of its origin, would have been disposed to insist on British.

In the course of cross-examination it was urged by Mr. J. W. Morris (for Berk, Agnew and Knoblauch) that large users of salt, who bought it for use in chemical manufacture, oil cake and soap manufacture, meat packing, etc., and who often bought ex quay, were well aware that the salt was of foreign origin. Witness, however, mentioned specific cases in which large users of salt, who had originally bought from British manufacturers, had commenced buying elsewhere, being unaware that it was of foreign origin; but when they had learned that it was foreign they had obtained future supplies from British manufacturers.

Mr. Carrick, in reply to further questions, agreed that there was no satisfactory method of marking loose salt. He was not suggesting that there was any deliberate substitution of foreign for British salt by traders.

Mr. MORRIS (addressing the committee on behalf of Berk, Agnew and Knoblauch) in opposition, emphasised that in 1932, when the production of salt in the United Kingdom was 692,000 tons, the imports amounted to only 52,000 tons; of the latter amount, approximately 38,000 tons was imported in bulk, leaving approximately 13,000 or 14,000 tons imported in bags. In regard to the latter, he submitted that no case had been made out for marking, and that the purchasers of it, in nearly every case, knew its origin.

Mr. A. D. BERK (director of F. W. Berk and Co., Ltd.), giving evidence against the application, said that his firm

imported the German ground and unground rock salt. The only three companies of consequence who were importing the German salt were F. W. Berk and Co., Ltd., Frank Agnew, Ltd., and Hugo Knoblauch and Co., Ltd. Whereas the home-manufactured salt was obtained from brine, either by vacuum evaporation or direct heat evaporation, 99 or 99½ per cent. of the German salt imported was selected and ground rock salt. Only a microscopic quantity of evaporated salt came here from Germany. Broadly speaking he could distinguish German salt from English salt by its hardness.

The committee will report to the Board in due course.

## Fibre Treatment with Ionised Oils

### A New Method for Improved Qualities

As the result of tests extending over some years it was discovered that "ionised oils" (mainly composed of blends of vegetable oils) form excellent batching and processing media for all vegetable fibres such as sisal, hemp, jute, New Zealand hemp (*Phormium tenax*), Columbian pita, and also flax, cotton and ramie, and even artificial silk. In the case of flax there is every possibility of the process having a revolutionary effect on the industry. This fibre, when treated by immersion before spinning or processing, yields a definitely improved yarn or fabric—it is whiter, softer and less creasable, whilst the loss in bleaching and finishing is considerably lowered and the solubility (or strength) is not impaired. With bast or "hard" fibres such as sisal, hemp and tenax, treatment in ionised oils enables these to be split up into their finer filaments, thereby providing new outlets and opening up new uses in the making of fabrics, upholstery and ribbonised fibre for straw hats and tapestry, etc.

Sisal rope and twine when made from fibres which have been batched or treated with the oils are more flexible; they are better in colour and of a higher flotation value. In this respect a new blend combining soluble wax compound is used for enlarging and impregnating the fibres, thereby bringing the resistance to water absorption nearer to manilla hemp. Coir (coconut fibre) has even been retted and softened enabling it to be spun and used for purposes deemed impossible.

In the jute industry the application of ionised oils has advantages which should eliminate the troubles which undoubtedly emanate from some of the "batching" fluids at present used in many mills, and when used as a "batching" fluid no emulsifying agent is necessary. Jute fibre which has been softened and bleached with the oils possesses a softness, flexibility and the possibility of finer fabrics than hitherto; here again, it may open up many new fields and directions which may mean revival in an industry which has suffered badly of late.

For batching and processing fibres, the oils are mixed with water or any other compound or material and applied in known manner. For softening and bleaching, a solution of ionised oil, comprising one part of oil to 6 or even 12 parts of water, is made up and maintained at about 180° F., the fibre being immersed for a period which varies from  $\frac{1}{2}$  to  $\frac{3}{2}$  hours, according to the degree of softness and colour which it is desired to obtain. During immersion, the fibres are rolled or compressed several times to exclude the hardened gums and residual fleshy matter.

Generally, ionised oils are produced in several ranges for the following purposes, relative to vegetable fibres: (1) "Batching" and processing blends for sisal, jute hemp, etc. (2) "Batching" and processing blends for flax, cotton and artificial silk. (3) Softening and partial bleaching blends for all bast and soft fibres. In the processing of flax, cotton and artificial silk, the non-oxidising qualities and scouring out properties of the oils make their use an advantage.

Ionised oils are also being used in other industries, including wool, feathers, furs and skins, toilet preparations, laundry work, carpet making and paint manufacture. They are manufactured by H. G. Products, Ltd. The process of manufacture is such that the oils are first treated to a modified and improved sulphonation process, followed by three other stages, including electrolytic treatment and ozone impregna-

tion. As a result of these processes the oils are perfectly water-miscible, light in colour, non-oxidising, and non-inflammable. They possess definite scouring and wetting-out properties, have softening effects on vegetable and animal fibres, and bring about the loosening of vegetable fleshy matter and gums. In addition, they have bleaching and lubricating qualities, will emulsify with other oils (either mineral, animal or vegetable), and are saponifying and penetrating. Finally, they are highly antiseptic, bactericidal and fungicidal.

## Cornish China Clay Mines

### Alleged Interference with Rights

THE claim for £4,499 against the Kingsbridge and Salcombe Water Board was heard at the Royal Hotel, Plymouth, on Wednesday and Thursday last week and revealed some interesting points on the china clay industry. Mr. John Willmot was the official arbitrator.

The claim was made under the Acquisition of Land (Assessment of Compensation) Act, 1919, by F. W. Skardon, solicitor, and Henry Hurrell, corn merchant, both of Plymouth. They were represented by Mr. Griffith Morgan, and the Water Board was defended by Mr. William Allen, K.C., and the Hon. Ewen Montague.

Mr. Morgan contended that the claimants regarded the purchase of land on Brent Moor as having interfered with their china clay rights, and that the use of the Bala Brook, a tributary of the Avon, from which the Board drew its water restricted them in the normal enjoyment of their rights. Mr. Morgan said the claimants suggested that they had a perfect right to take the water and use it.

Describing the discharge of clay water for which exceptional precautions have to be taken by the construction of "settling ponds," Mr. R. G. Hansford-Worth said that modern science held that the discharge of water from a china clay mine was good for people.

Mr. J. M. Coon, the well-known china clay expert at St. Austell, said that he had inspected the pit at Brent Moor Works and, having analysed samples of the china clay mined there, was of the opinion that the quality was fully up to the general average. He thought that a small pit outside the clay-pit combine would be remunerative. Asked what he thought of the future of the china clay industry in the west, Mr. Coon said that America must have more English clay. The home industry was expanding because of the larger number of manufacturers using china clay.

In reply to Mr. Allen, Mr. Coon said that he knew America's production of clay had enormously increased owing, in his opinion, to the foolishness of St. Austell producers and to the increase made in the price of English clays.

Mr. Richard Hooper, china clay works manager for the Pochin group of mines of the English Clays, Lovering, Pochin and Co., Ltd., St. Austell, gave particulars of the results of sinking trial pits on the claimants' land and said he found the clay unsatisfactory both in quality and quantity.

The evidence concluded and the speeches of counsel were reserved to be heard in London.

# British Rubber Reclaiming Enterprise

**T**HE rubber reclaiming industry has been carried on at Manchester for twenty-five years, but it was not until a little over two months ago that the company concerned became a public company under English management and control. The Rubber Regenerating Co., Ltd., whose works are at Trafford Park, Manchester, is the largest producer of alkali reclaim rubber in the United Kingdom and produces more than all its competitors put together. Alkali reclaim was originally used as a substitute for raw rubber and in order to dispose of rubber waste. In the past decade important advances in the art of reclaiming have been made and reclaimed rubber is now established as a normal constituent of rubber compounds used in manufacturing processes.

During the worst of the depression when rubber was selling below twopence per pound, standard grades of reclaim were selling at a premium of a penny per pound and more, according to quality. There are several reasons for the extension of reclaim as a regular compounding ingredient. The composition of the reclaim manufactured at Trafford Park is guaranteed and among the elements is a small proportion of alkali.

This acts as an accelerator, *i.e.*, it reduces the time required to vulcanise the finished rubber article, thus effecting an appreciable saving in costs. It also improves the plasticity and reduces the expense of milling. Reclaim is becoming standard in nearly all rubber products and is used by general rubber goods manufacturers throughout the world for all classes of goods, including tyres. The commodity has an individual status, quite apart from its use as a rubber substitute. The proportion of reclaim consumed varies according to its price relationship to crude rubber, approximately between 20 and 45 per cent. of crude rubber consumption.

## Birth of the Industry

The birth of the modern reclaiming industry may be dated from the commencement of the present century, when the industrial applications of the patents taken out by Price and Marks came into being. From that time the output and use of alkali reclaimed rubber has grown enormously, but it was unfortunate that technical research did not at once keep pace with the rapid strides of the reclaiming industry. In earlier days the impelling factor accounting for its large use was the idea that reclaim served fundamentally as a diluent or cheapener. This has been proved to be merely one of many, and certainly the least important, of the advantages which its use entails.

The instability in crude rubber prices which has prevailed since the entry of the rubber trade to the world's great industries compelled rubber chemists to investigate reclaim from a technical as well as economic angle, and other factors were brought to light which enabled reclaim to survive triumphantly the debacle in the price of crude rubber which apparently reached its climax in 1932. That reclaim emerged from such a test is a commentary on its utility which needs no enlargement.

## A Standard Compounding Ingredient

Reclaim has become a standardised compounding ingredient. Possessing low volume cost it also helps to stabilise both cure and variations in processing. A pronounced softener, it enables greater output and economy to be effected by reducing the breaking-down time. By the same rule, reclaim facilitates the incorporation of fillers to a greater extent, and by reducing frictional heat minimises the danger of set up. It has a definite accelerating effect during cure, enabling a marked economy to be made on the percentage of organic accelerator employed. In the case of often violent fluctuations in the price of raw rubber, the factory compounding is able to employ it as a stabiliser on his compound costs, as such fluctuations in price are far less marked in the case of reclaim.

For flooring and leather substitute soles reclaim rubber imparts desirable deadness and non-slip characteristics. Milling and calendering operations are considerably eased, while for spreading doughs a decided solvent economy can be effected. Statistics show that the United States have

## Wealth in Discarded Motor Car Tyres and Rubber Shoes

employed during the boom periods and following the great war up to 50 per cent. of reclaim calculated against the consumption of crude rubber.

The Rubber Regenerating Co., Ltd., commenced operations as manufacturers of reclaim rubber in 1909. There are two main production units at Trafford Park. The second and most important unit was completed in 1931, and is the most up-to-date plant of its kind in the country. Extensive alterations to the original production unit are about to be commenced which will result in increased efficiency, flexibility and production capacity. The alkali reclaim products of the company are well known for their purity and consistent behaviour in manufacturing processes.

The principal "raw material" for all kinds of reclaim is disused motor tyres. Rubber shoes, rubber tubes, inner tubes and other similar articles are also used in smaller quantities. The tyres are first cut in halves and shorn of their metallic beading by machinery, and they are then conveyed to disintegrators which reduce them to a suitable particle size for devulcanising. The ground tyres are passed by means of mechanical conveyors over magnetic separators to vessels in which the rubber is mixed with a caustic soda solution and other chemicals. In these vessels the cotton originally mixed with the rubber is separated out and converted into hydrocellulose. The rubber is plasticised and nearly all the free sulphur is removed. The vessels are then discharged and the rubber is separated from the liquor and thoroughly washed. After an extensive drying process the material is delivered to mixers where it is massed and is then strained through fine-mesh screens to secure uniform composition.

The rubber passes to sheeting mills and strainers, the mills turning out the reclaim in endless sheets of a thickness of 0.0002 to 0.0003 in. The rubber leaving the mills is so viscous that when wound on to rollers the many thicknesses can be compressed and cut off in sheets an inch thick. These slabs are cut to a convenient size for packing, and are despatched mainly to rubber manufacturers throughout the country for incorporating with crude rubber in the manufacture of new articles. A substantial proportion of the output from Trafford Park is exported.

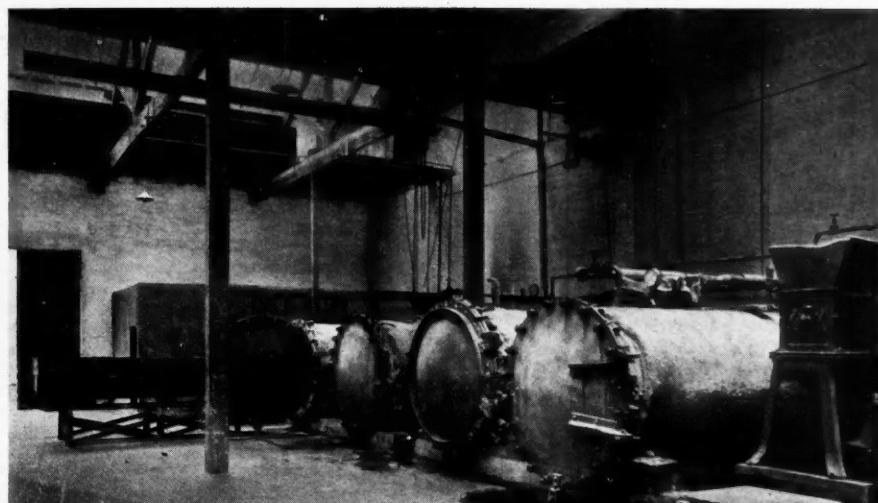
## A New Solvent

Among the new manufactures at Trafford Park is a solvent, the invention of Mr. F. N. Pickett, which has a wide field of application. The first product to be commercially manufactured is solvent reclaim. It is anticipated that an increasing demand for this material for the mechanical and shoe trades will be encountered as the merits of the reclaim become more widely appreciated. Experiments have been undertaken with regard to reclamation of cotton from the used tyres. Carbon black and other fillers are also recovered by the solvent process. A further product, derived from solvent reclaim, is ebonite dust which is used for hard rubber products such as accumulator boxes and other moulded articles. The solvent itself in a refined form has extensive potentialities for use in other industries. It has already been used on an experimental scale with encouraging results as a turpentine substitute for paints, varnishes, polishes, etc., and as a crude rubber solvent for the production of efficient and economical rubber spreaders. Possibilities further afield lie in the application of the solvent as a cleansing agent and also for use in the dyeing industry, and in the production of fine lubricating oils. Equipment suitable, with minor alterations, for production of the solvent has been leased and it is anticipated that output on a commercial scale will be attained shortly.

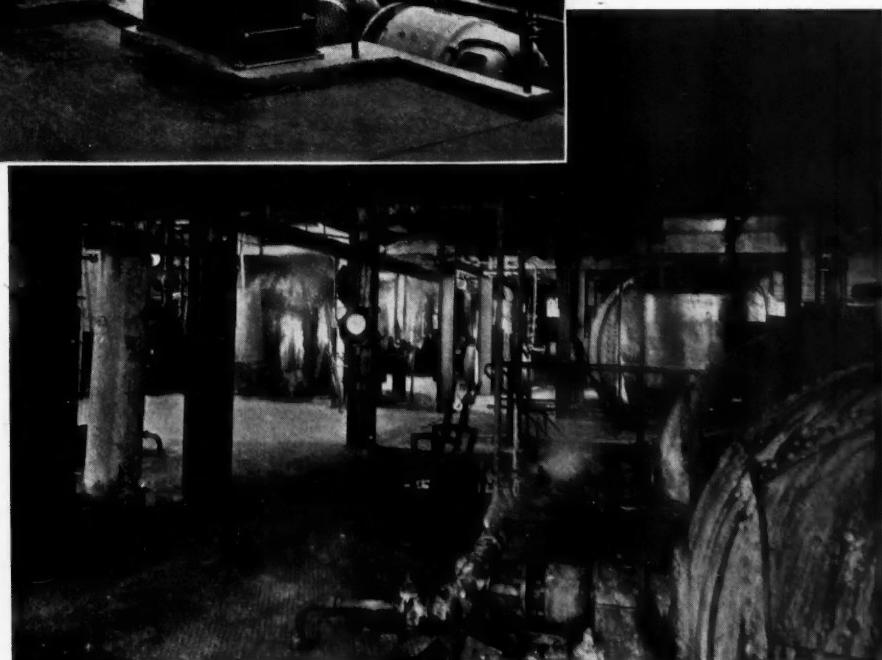
Mr. F. N. Pickett is the chairman of the company, and Mr. W. G. Essex is managing director. Mr. Essex, under whose technical supervision the operations at Trafford Park have been brought to their present standard of efficiency, was formerly in charge of the Canadian undertaking of the original United States owners of the concern.

## Rubber Reclaiming at Manchester

On the right is a process room at the Trafford Park works of the Rubber Regenerating Co., Ltd., comprising the devulcanisers used for making solvent and other speciality reclaims.



Left : One of the mill rooms showing the finishing refiners. These mills turn out reclaim rubber in thicknesses ranging from 0.002 in. upwards.



Right : In this process room are a number of spherical digesters used for making alkali reclaim.

The Trafford Park works cover seven acres, and their outstanding feature is that they are planned for carrying out every process with a minimum of labour.

## Notes and Reports from the Societies

### Society of Chemical Industry

#### Glasgow Section : Microchemistry

THE Glasgow Sections of the Society of Chemical Industry and the Institute of Chemistry held a symposium on microchemistry, in the Chemistry Department of Glasgow University on November 23. Dr. P. F. Gordon occupied the chair.

Dr. R. Roger dealt with what he called the hemi-micro method of conducting organic combustions. In this method, which had been devised to obviate the difficulties attendant on the Pregl micro method, Dr. Roger uses from 30 to 40 milligrams of substance. In place of the lead peroxide filling used by Pregl the ordinary copper oxide packing is employed. The tube is of the Pregl type, constricted at one end and in this end there is an asbestos plug so arranged that it allows 10-12 cc. of air to pass during the combustion. The copper oxide follows this plug and then the boat (which is of quartz), and finally there is a copper oxide spiral. The absorption train, which is attached to the narrow end of the tube, is of a type evolved by Dr. Roger. The tubes are fitted with ground-in stoppers and near the stopper end there is a side tube; the other end of the tube is drawn out and bent at right angles. In the restricted end there is a small glass plate with a hole in it to prevent any sudden inrush of water. Three such tubes are employed, two containing soda lime and one calcium chloride. The air is passed through a Pregl regulator, and is dried and freed from CO<sub>2</sub> by passing through calcium chloride and soda lime respectively.

By this method the combustion is over in about  $\frac{1}{2}$  hour and the absorption train is weighed after standing in a balance case for  $\frac{1}{4}$  hour. The results of combustions given showed that the agreement between analytical figures and the theoretical was very good, particularly in the case of hydrogen. For organic substances containing sulphur, halogen and nitrogen, Dr. Roger uses tubes with modified packings and obtains good results.

#### Work on True Micro Methods

Dr. D. T. Gibson described work which he had been doing on true micro methods. He had used the orthodox Pregl procedure to begin with but had been dissatisfied with the behaviour of the lead peroxide packing, and for substances free from nitrogen he was now conducting combustions using only platinum gauze as a packing. He had dispensed with the asbestos plug which was used to regulate the flow of air and now controlled the air inflow by a constriction in the tube. His original constricted tube proved troublesome with substances containing a high proportion of hydrogen, due to blockade of the tube by water. This difficulty had been overcome on the suggestion of Dr. Bell, of Aberdeen.

Further improvements have been made by the substitution of the Pregl cymene bath by a small electric furnace giving a temperature of 200°, and by the provision of a mercury manometer to gauge the inflow of gas instead of the Pregl water bubbler. A manometer using a high boiling paraffin had been suggested, but Dr. Gibson considered it dangerous to use a hydrocarbon owing to the chance of slight evaporation taking place and interfering with the estimation. Using an ordinary mercury manometer the motion of the liquid consequent on alteration of the pressure of the air was too small to be measured, and Dr. Gibson designed a manometer inclined at such an angle that the effective density of mercury was only 1/13th of its normal value. In this way deviations in pressure could be noted.

After the lecture demonstrations of micro combustions for the estimation of carbon, hydrogen, halides, nitrogen and sulphur were given. The separation of group I metals on a very small scale, and B.D.H. "spot" tests were also shown.

#### London Section : Phenols of Low Temperature Tar

THE isolation and identification of phenols from low temperature tar was described in a joint paper by Professor G. T. Morgan and Mr. A. E. J. Pettet, read before the London Section of the Society of Chemical Industry on December 3. Numerous investigators have already examined the phenols of low temperature tar from bituminous coal, but their work

has usually been superficial and in only a few cases has any attempt been made to detect individual compounds. Even in the more fundamental researches the phenols were frequently identified only as derivatives or as oxidation products from complex fractions.

In order to avoid any possibility of alteration in these constituents through thermal decomposition, the phenols utilised in Professor Morgan's researches were obtained by systematic treatment of low temperature tar from Kinnel coal with organic solvents and inorganic reagents at temperatures not exceeding 125°. The crude phenols, purified from neutral oil, were separated by extraction with cold petroleum (b.p. 40°-60°) into petroleum-soluble and petroleum-insoluble phenols. The latter were extracted with ether, yielding ether-insoluble resins and an ethereal extract, which was added to a large volume of petroleum (b.p. 40°-60°) with the production of a precipitate of ether-soluble resins and an ether-petroleum solution of "tar acids," which, combined with the water distillation residue, were first "topped" by heating in an oil bath to 125° under a pressure of 2 mm. and then extracted repeatedly with boiling petroleum (first of b.p. 40°-60° and then of b.p. 60°-80°). The combined petroleum extracts, freed from solvent, were again topped to 125°/2 mm. and then distilled up to 125° under a pressure maintained below 0.001 mm. by means of a Kaye single-stage mercury vapour pump protected from corrosive vapour by means of a trap cooled in solid carbon dioxide. The clear golden-yellow distillate, which was entirely free from decomposed products, was fractionally distilled under reduced pressure into a series of 5° fractions, ranging in boiling point from 90° to 150°/2 mm., together with a considerable residue not volatile at 150°/2 mm.

The phenols soluble in cold petroleum were divided by distillation with water under reduced pressure (approx. 100 mm.) into a steam volatile distillate and a less volatile residue. The phenols separated from the distillate, combined with "toppings" from less volatile "tar acids," were distilled under 2 mm. pressure and finally distilled fractionally under atmospheric pressure without apparent decomposition through an electrically-heated, all-glass Dufton column until a series of constant boiling 2° fractions was obtained, ranging in boiling point from 183° to 240°. Constituents of the various fractions were then identified by isolating the component phenols for comparison with authentic specimens and their derivatives. The phenols thus identified included phenol; *o*-, *m*-, and *p*-cresols; *o*-4-, *m*-4-, *m*-5- and *p*-xylenols; iso-pseudocumeneol; 3-methyl-5-ethylphenol and *β*-naphthol, *β*-naphthol being identified as picrate.

#### Yorkshire Section : Water Supply

THE Yorkshire Section of the Society of Chemical Industry will hold a meeting on Monday, December 10, at 7.15 p.m., in the Chemistry Lecture Theatre, University of Leeds, when Dr. A. Parker, assistant director of Water Pollution Research, will read a paper on "Some Problems of Water Supply." He will deal with factors to be taken into account in ensuring ample quantities of water at all times, including periods of drought, for industrial and domestic requirements in towns and in rural areas; the need for a survey of available resources, both surface and underground; the prevention of pollution; methods of treatment of water to ensure satisfactory quality, such as filtration, disinfection, softening and hardening; and the subject of water supply and public health.

## Society of Glass Technology

#### Durability of Glass Containers

THE symposium on the "Chemical Durability of Glass in the Form of Containers" which opened at the Sheffield meeting in October, was continued at a meeting of the Society of Glass Technology held in the Fuel Lecture Theatre, The University, Leeds, on November 21, with the president, Mr. G. V. Evers, in the chair.

Professor W. E. S. Turner gave a short introduction, summarising the paper which he had given in October. Miss V.

Dimbleby, M.Sc., followed with a brief summary of the paper she gave in October, and Mr. H. S. Y. Gill, B.Sc.Tech., continued with a contribution on "The Action of Alcoholic Solutions on Glass Surfaces, with Special Reference to Containers." Mr. Gill illustrated his paper by lantern slides and specimens, most of the work described having been done on 4 oz. flat medicine bottles. Tests were described which involved the holding, at 30° and 60°, of various makes of these bottles filled with water, and pure alcoholic solutions of various strengths. It was shown that small flakes appeared in alcoholic solutions of 40-60 per cent. strength, by volume, more readily than in any other of the solutions studied. The rate of extraction of alkali from the glass appeared to decrease as the strength of the alcoholic solutions was raised, in all makes of the bottles, both at 30° and 60°. Bottles which had been stored some ten months previous to the tests appeared to show a greater tendency to flaking than new bottles. The actual behaviour of whisky and gin was somewhat obscured by the alkalinity or acidity of the samples employed.

A photomicrographic study of the flakes produced showed that, although to the naked eye there appeared to be variations in form and texture, there really was no difference, the flakes all closely resembling those which had been obtained in the Department at Sheffield in bottles which had been stored in south windows full of water or dilute acid, for about four years. Chemical analysis proved that these flakes were highly siliceous.

## Institution of the Rubber Industry

### Annual Meeting and Dinner

THE annual meeting and dinner of the Institution of the Rubber Industry was held at Princes Galleries, Piccadilly, London, on November 30. The president, Sir George Beharrell, was in the chair. Mr. F. D. Ascoli, chairman of council, said the past year had not been an altogether easy one as it had been necessary to get the organisation on to sound ground. That had involved considerable alterations in the status of members and subscriptions but the council had felt it was necessary to do this to place the Institution on a really sound basis. Sir George Beharrell was re-elected president for the coming year. There was a company of about 250 at the annual dinner.

Mr. T. MARTIN HARVEY, chairman of the Cable Makers Association, proposed the "Institution of the Rubber Industry" and said that the industry could claim to be an important one from the financial aspect, for in one section alone, the planting and preparation of the raw product in foreign fields, it had attracted no less than £100,000,000 from the investors of Great Britain and Holland. Until the foundations of the Institution of the Rubber Industry were laid in 1921 the industry had been content to muddle along with unscientific management and in a casual manner, but it had become necessary for the people concerned in the industry to see that their businesses were placed on a better basis and that the knowledge gained by one section or another should be correlated.

### Application for Royal Charter

Sir GEORGE BEHARRELL, responding to the toast, said the Institution was, so to speak, crossing the stream. Application was being made for a Royal Charter of incorporation and it was on that account alone that he had consented to occupy the chair a little longer. In spite of the improvement in trade, we were still suffering from an excess capacity in the manufacture of goods and the spirit of nationalism was drawing still more and more productions away from factories which were not even now working to capacity because further new factories were being established in various countries.

The PRESIDENT presented the Colwyn Gold Medal to Dr. D. F. Twiss, of the Dunlop Rubber Co.

Dr. D. F. Twiss, acknowledging the award, said he had been fortunate in spending the past 20 or 25 years in the rubber industry. Two decades ago plantation rubber was still sufficiently novel to be a subject of suspicion, and traces of that suspicion still remained.

Mr. F. W. HINDE proposed the toast of "The President." Speaking of the future he said it was difficult and dangerous for anybody to try to make forecasts in the present state of

unsettlement in the political and economic world, but the other day Sir Herbert Austin had stated that, in his view, in ten years' time there would be in this country at least 10 million motor-cars in use. If this were true, assuming the replacement of, say, two tyres per vehicle per annum, it meant an annual consumption of 20 million tyres in ten years' time and somebody was going to be very busy.

The PRESIDENT, acknowledging the toast, said he would always look back on the great year of 1921, because in that year the Dunlop Co. succeeded in losing £13,000,000. He had thought that would remain a record but another company said "No, we will do better," and lost considerably more.

## Institute of Chemistry

### Aberdeen Section : Ultra-Violet Light in Analytical Work

A MEETING of the Aberdeen and North of Scotland Section of the Institute of Chemistry was held in the Agricultural Department, Marischal College, Aberdeen, on December 4, when Mr. Alfred Hill, B.Sc., A.I.C., delivered a lecture on "The Use of Ultra-Violet Light in Analytical Work."

The lecturer first described the ultra-violet ray lamp with which he had been experimenting, and which was of the type known as the Hanovia utility lamp. He then proceeded to outline briefly the history of the use of ultra-violet light in analyses, stating that, although of comparatively recent introduction, great progress had been made in its use. The speaker stressed the point that although the lamp could not in any way replace chemical analyses, it was of considerable help in diagnosing certain problems connected with scientific investigation in many walks of life. The lamp was now a recognised appliance in the laboratories of many up-to-date institutions and was employed by chemists in a large number of industrial undertakings.

Mr. Hill described how the ultra-violet rays caused certain substances to fluoresce or glow in varying colours according to their composition, and that some chemicals, for instance, although very closely related chemically, fluoresced in entirely different colours if pure, when subjected to filtered ultra-violet light, so that these compounds could be easily differentiated. It was demonstrated, by the aid of the lamp, how the chemist could make use of these rays in many ways in the course of routine analyses and also demonstrated to the industrial chemist, whether he be connected with the paper industry, the drug industry, textiles, jams and jellies, and a number of other industries, that the lamp could at times set him on the right road towards the solution of a problem.

### Ultra-Violet Lamp in Legal Work

Within recent years, the ultra-violet lamp had been used successfully in legal work, in the detection of forgery and alterations and erasures on legal documents of importance. The customs authorities of several countries had made use of the lamp in rapidly identifying contraband goods. The advantage of such methods of diagnosis lies in the fact that, particularly in legal and police work, the article to be examined under the lamp suffers no deterioration.

Interesting examples of uses to which the ultra-violet ray may be put were shown by Mr. Hill. Butter can easily be distinguished from margarine without any previous preparation, while it is possible to detect the adulteration of butter by the addition of small quantities of margarine or vegetable fats. Another interesting example of the detection of fraud was the case of the obliteration of the mark of origin on imported eggs. This stamp is easily deleted by various means without leaving any visible sign on the shell, but the erasure is always visible under the ultra-violet rays. The lamp has actually been the means of securing a conviction in several cases of this nature. It is somewhat similar in the case of erasure or alteration of words written in ink on a document, but the erasure, whether carried out by the use of chemicals or by scraping, can be definitely detected. In some experiments, although the treatment was carried out very carefully, and no visible trace of the words could be noted, it was possible to read the actual words when subjected to the rays of the lamp. So also most secret inks could be made to disclose their secrets. The presence of certain preservatives in foodstuffs could be rapidly detected. Milk fluoresces

canary yellow, but a trace of sodium salicylate will alter the colour to bluish-white.

Various drugs and dyes fluoresce differently, either by themselves or under treatment by various reagents. The lecturer showed a series of yellow-coloured papers which under the lamp appeared in varying colours: some yellows in filtered ultra-violet light were purple or almost black, others lavender, while the yellow wrapping on the box of a well-known brand of matches fluoresced a brilliant yellow. The fluorescence of several cattle-cakes, poultry foods, artificial fertilisers and samples of seeds and other materials was demonstrated.

## Institution of Chemical Engineers

### The Annual Reception

THE annual reception of the Institution of Chemical Engineers was held on November 29 at Sutherland House, Curzon Street, London. A large number of guests were received by Mr. W. Macnab, president of the Institution, and the fact that the reception was held on the day of the marriage of the Duke of Kent and Princess Marina rendered the gathering of more than ordinary interest. It ranked, indeed, as one of the many wedding-day celebrations, and a section of the sight-seeing crowds watched the arrival of the guests. Following the formal reception, dancing was enjoyed and light refreshments were served. Among those who accepted invitations to be present were:

Lord and Lady Reading, Lord and Lady Eustace Percy, Lord and Lady Plender, Sir John and Lady Simon, Sir Robert Hadfield, Sir Richard and Lady Pease, Sir Richard and Lady Gregory, Sir Horace and Lady Wilson, Sir Alexander and Lady Gibb, Sir Henry Maybury, Sir Frank and Lady Smith, Sir Edward and Lady Crowe, Sir Clement and Lady Hindley, Sir Robert and Lady Robertson, Sir William and Lady Alexander, Sir William Bragg, Sir James and Lady Henderson, Sir John and Lady Russell, Sir David and Lady Milne-Watson, Sir Harold and Lady Hartley, Sir Francis and Lady Goodenough, Sir E. Graham Little, M.P., and Lady Graham Little, Sir Christopher and Lady Clayton, Mr. J. R. W. Alexander, Professor and Mrs. E. N. da C. Andrade, Dr. and Mrs. E. F. Armstrong, Dr. and Mrs. G. D. Bengough, Mr. and Mrs. C. Valon Bennett, Professor W. A. Bone and Miss Bone, Colonel and Mrs. C. H. Bressey, Professor and Mrs. H. V. A. Briscoe, Mr. and Mrs. M. W. Burt, Dr. and Mrs. H. J. Bush, Mr. W. J. A. Butterfield and Miss Butterfield, Mr. W. A. S. Calder, Dr. and Mrs. H. T. Calvert, Dr. and Mrs. F. H. Carr, Mr. and Mrs. S. E. Carr, Professor and Mrs. A. C. Chibnall, Mr. A. E. L. Chorlton, M.P., and Miss Chorlton, Mr. and Mrs. R. H. Clayton, Professor R. G. Clements, Dr. and Mrs. R. T. Colgate, Mr. and Mrs. H. W. Cremer, Mr. A. C. Cross (Editor of *THE CHEMICAL AGE*), Professor and Mrs. J. A. Crowther, Dr. and Mrs. W. Cullen, Mr. and Mrs. W. A. Damon, Professor and Mrs. C. H. Desch, Professor F. G. Donnan and Miss Donnan, Dr. and Mrs. C. V. Drysdale, Mr. and Mrs. E. C. Evans, Mr. and Mrs. E. V. Evans, Dr. and Mrs. J. Vargas Eyre, Dr. Margaret Fishenden, Major and Mrs. F. A. Freeth, Mr. and Mrs. C. S. Garland, Major V. F. Gloag, Mr. and Mrs. C. J. Goodwin, Mr. and Mrs. F. A. Greene, Dr. and Mrs. R. E. V. Hampson, Dr. and Mrs. W. H. Hatfield, Mr. and Mrs. W. Hawkyard, Dr. and Mrs. G. W. Himus, Professor B. W. Holman, Dr. and Mrs. L. A. Jordan, Mr. and Mrs. J. Kewley, Dr. and Mrs. J. G. King, Dr. and Mrs. L. H. Lampitt, Mr. and Mrs. C. LeMaistre, Mr. and Mrs. J. M. Leonard, Dr. and Mrs. R. Lessing, Dr. and Mrs. H. Levinstein, Mr. and Mrs. D. McDonald, Mr. C. J. T. Mackie, Mr. and Mrs. G. S. W. Marlow, Mr. and Mrs. Emile Mond, Professor and Mrs. G. T. Morgan, Mr. J. W. Napier, Dr. and Mrs. W. R. Ormandy, Dr. and Mrs. A. Parker, Mr. and Mrs. P. Parrish, Mr. J. G. Pearce, Dr. and Mrs. R. H. Pickard, Mr. and Mrs. R. B. Pilcher, Mr. and Mrs. H. V. Potter, Mr. and Mrs. J. Davidson Pratt, Mr. S. R. Price, Professor and Mr. A. O. Rankine, Mr. and Mrs. E. A. Reavell, Mr. and Mrs. J. Arthur Reavell, Mr. and Mrs. J. F. Ronca, Dr. and Mrs. R. Seligman, Engr. Capt. and Mrs. J. Fraser Shaw, Dr. and Mrs. F. S. Sinnatt, Mr. and Mrs. H. M. Spiers, Mr. and Mrs. H. Talbot, Alderman and Mrs. Edwin Thompson, Professor and Mrs. J. F. Thorpe, Mr. and Mrs. S. J. Tungay, Dr. A. J. V. Underwood, Professor S. G. M. Ure, Professor and Mrs. H. E. Watson, Mr.

and Mrs. E. I. Weber, Mr. and Mrs. J. H. West, Mr. J. Arthur Williams, Mr. and Mrs. W. H. Woodcock, Mr. C. B. Woodley, Miss Wright, Dr. P. C. Young, and Dr. Janet Michael.

## British Cyanides Co., Ltd.

### Important New Developments

SPEAKING at the annual general meeting of the British Cyanides Co., Ltd., held in London, on November 28, Mr. Kenneth M. Chance (chairman and managing director) recalled the progress made during the period of thirty-nine months covered by the two previous years and the fifteen months covered by the accounts now submitted—the period during which profits had been made. Upwards of £70,000 had been spent in capital extensions to the factories at Oldbury and Streetly; £21,674 had been spent out of revenue on research and new developments; £11,200 had been added to reserve account out of profits, £12,433 from profits on the sale of investments and £1,075 from premiums on shares, a total of £25,300. There had also been £9,123 written off the value of the plant installed at the Birmingham Gasworks and £7,645 for obsolescence, etc. The net profits earned by the group had increased from £9,321 for 1932 to £12,725 for 1933 and £26,256 for the period under review of fifteen months. The first dividend on the ordinary shares of the company since its reconstruction was paid in 1933, at the rate of 3 per cent.; a second of 4 per cent. was paid last December, and the directors proposed that the third dividend should take the form of a final dividend of 5 per cent., payable on December 14, leaving a balance to be carried forward of £2,288. The issued capital had been increased by £36,600.

The position of the company had been immensely strengthened by the purchase of the Pollopas Patents, and the agreements with their associations on the Continent of Europe which accompanies that purchase. The value of those patents had been unquestionably consolidated by their recognition by the leading chemical firms in Switzerland, the Society of Chemical Industry in Basle, and by Imperial Chemical Industries. A more tangible asset arising from the purchase of those patents was the business derived from the manufacture, at Oldbury, of Pollopas moulding powder.

### Increased Value of Goodwill

By far the greatest gain that the company had made, however, was the increased value of its goodwill in the manufacture of chemicals. The cost of production of thiourea had been greatly reduced by the installation of new and improved plant at low cost; a process had been worked out and proved on the manufacturing scale for the production of an economic basis of urea, and the manufacture and sale of hexamine was steadily on the increase. Beetle Products had improved the quality of their moulding powders, had introduced the powder known as "densified Beetle," had put on the market two resins for making lacquers, had developed new markets for other resins, and had succeeded in making a moulding powder which would compete both in price and in quality with the phenol powders that were so largely used. In connection with Streetly's activities a small development company had been formed, jointly with Rockhard resins, called Extruded Plastics, Ltd. The manufacturing operations of that company would take place at Streetly. Turning to Beetle Products, sales of moulding powder during the past summer months were definitely disappointing, being almost exactly the same as for the same months of 1933. Sales of lacquer resins had increased, and the merits of those resins were becoming more widely recognised. Much importance was attached to the new moulding powder, "Scarab," which could be made at a competitive price.

The directors had prepared a scheme which was designed to provide ultimately upwards of £90,000 of additional capital. Each holder of ordinary shares or of options over ordinary shares would have the right to apply for one share for every twelve now held, at a price of 2s. 6d. per share, a premium of 6d. per share. Each share thus issued would carry an option over one share at the price of 3s. per share, the option being exercisable at the end of any quarter commencing with the end of March next and terminating at the end of December, 1936. The issue had been underwritten.

## Personal Notes

MR. WILLIAM J. WIGNEY, European manager of the National Supply Corporation, has accepted the office of president of the Oil Industries Club.

MR. JOHN SMITH and Mr. William Walker, commercial managers, Mr. George E. Wolstenholme, senior outdoor sales representative, and Mr. C. S. Dickie, chief financial officer, all of Sheffield, have been appointed local directors of Thos. Firth and John Brown, Ltd.

THE EXAMINERS have reported to the Vice-Chancellor that the Gibbs scholarship in chemistry, 1934, has been awarded to M. W. Lister, scholar of Oriel College. Proxime accessit: P. A. Small, exhibitioner of Exeter College. Honourably mentioned: F. J. McQuillin, scholar of Christ Church, and L. A. K. Staveley, scholar of Trinity College.

MR. RALPH MARTIN BEWICK, a former director of the United Alkali Co., has died at Caterham, Surrey. He was 72 years old and was the son of Mr. Ralph Bewick, of Gateshead-on-Tyne. He entered the chemical trade on leaving school and for many years was a traveller in foreign countries for the United Alkali Co. He was appointed a director and held this post until 1926 when the firm merged with Imperial Chemical Industries, Ltd. He was also associated formerly with the Bede Metal Co., Hebburn-on-Tyne.

MR. W. DIAMOND, of Marley Hill, has been elected president of the Northern section of the Coke Oven Managers' Association. In his presidential address he appealed for more research work in the industry and stressed the importance of finding new outlets for the use of gas, which the modern coke oven has in abundance. He suggested owners of by-product plant should contribute to a fund for the setting up of a research laboratory where the possibilities of hydrogenation could be undertaken. He said there were many chemists who were willing to enter such laboratories.

MR. GEORGE F. EARLE, managing director of G. and T. Earle, Ltd., cement manufacturers, has been elected president of the Hull Chamber of Commerce.

MR. G. L. MACFADSEN, chief assistant in the coke oven and brickworks department of the Consett Iron Co., county Durham, has retired and has received a parting gift from his colleagues.

MR. R. P. EKINS, of Port Sunlight, has been appointed works manager of the Icilma, Ltd., factory in London. Mr. Ekins went to Port Sunlight in January, 1928, and was for three and a half years in the soapmaking laboratory of Lever Bros. From June, 1931, until February of the following year he was assistant works manager at the Bankhall factory of R. S. Hudson, Ltd. He then returned to Port Sunlight, and has been attached to the works statistical department.

MR. E. W. NEWTON, who died at Cambourne on November 30, was an outstanding personality who was known to a wide area as the general secretary to the Royal Cornwall Polytechnic Society. For some months Mr. Newton had been very ill but had been showing signs of a return to convalescence, and his death came quite unexpectedly. He was a member of an old Cambourne family renowned as scientists and instrument makers, whose traditions he fulfilled with characteristic ability.

PROFESSOR SIR HORACE LAMB, the *doyen* of the ex-presidents of the British Association, who, as reported in THE CHEMICAL AGE last week, attained his eighty-fifth birthday on November 27, died on Tuesday. Sir Horace was born at Stockport, and received his education at the Stockport Grammar School, Owens College, Manchester, and Trinity College, Cambridge, of which he was made a Fellow sixty-two years ago. Sir Horace Lamb, who was president of the British Association in 1925, resided at Cambridge.

## News from the Allied Industries

### Carbonisation

IN THE COMPANIES COURT, on Monday, Mr. Justice Eve had before him a petition by T. and R. W. Bower, of Darlington, for the compulsory winding-up of T. and R. W. Bower (Illingworth) Carbonisation Co., Ltd. Mr. Turner said this was a petition by creditors for £10,000 odd and interest. As far as he knew there was no opposition. The company did not appear. His lordship made the usual compulsory order.

### Non-Ferrous Metals

THE NEXT MEETING OF THE ZINC CARTEL will take place in Brussels about the middle of this month. So far none of the members has officially declared his withdrawal from the Cartel. It is considered that one fact which may influence the price tendency is the intention attributed to the British Government of reducing or even cancelling the import duty on zinc.

### Artificial Silk

THE STATUTORY FIRST MEETINGS of the creditors and shareholders of Alliance Artificial Silk, Ltd., of Oulton Broad, Lowestoft, were held in London, on November 28, the order to wind up the company having been made on October 8 last. Mr. J. Barwick Thompson, official receiver, reported that in consequence of injudicious allocations of the company's funds, the company was unable to meet its obligations, and an arrangement was made under which creditors for £95,028 accepted debentures in payment of their claims. A further debenture for £30,000 was issued in March, 1932, and in March, 1934, a receiver was appointed for the holder of this bond, and subsequently a receiver was appointed for the holders of the £95,028 debentures. A draft statement of affairs lodged under the liquidation showed total liabilities

£149,991, of which £131,233 was in respect of debentures. The assets were valued at £76,412, which showed a deficiency of about £60,000 with regard to debenture-holders. The liquidation was left in the hands of the official receiver, to be assisted by a commission of inspection consisting of three creditors and two shareholders.

### Rubber

THE "INDIA RUBBER JOURNAL" has published a special fiftieth anniversary number. The rubber industry, the Rubber Growers' Association, the Institution of the Rubber Industry, and the Rubber Trade Association are each dealt with historically, and there are accounts by well-known authorities of the industry in various other countries. "The Trend of Future Rubber Research" is the subject of an article by Dr. A. van Rossem, and latex receives full treatment at the hands of Dr. E. A. Hauser and Dr. H. P. Stevens.

### Bleaching and Dyeing

A SERIOUS DISPUTE in the Lancashire and Yorkshire bleaching, dyeing, and finishing trade involving 80,000 operatives was disclosed at a meeting of joint dyers' executives representing five principal unions in the trade, held at Bradford, on December 1. The meeting decided to ask their members for authority to give three months' notice to terminate agreement and to ask members in the event of deciding to terminate agreement if they are willing to carry out instructions to refuse to work in excess of forty-eight hours. It was also decided that on conclusion of the three months' notice to terminate agreement in the event of failure to reach conclusions with the employers on the question of an advance in wages, the restoration of the basic wage agreement, and conditions relating to the limitation of working hours authority be given to hand in a week's notice to cease work.

## Letter to the Editor

### The Farce of Pharmacy

SIR—I write to support the letter on "Chemists and the Poisons Act" from Mr. F. Hulse in THE CHEMICAL AGE of December 1. The need to which he refers is urgent. The complexity of modern chemistry and the highly complex chemicals and alkaloids, which now enter into modern medicine, are beyond the control and comprehension of the pharmacist. It requires the training of a technical, analytical or industrial chemist to understand, manufacture and standardise these substances. The pharmacist has neither the training nor qualification to handle or deal in these substances. A pharmacist does not understand the chemistry of the barbiturates, insulin, thyroin, and ephedrine; 20 units of insulin on a medical man's prescription conveys nothing to him, for he has no training in therapeutics, or physiology, or the chemistry of food and drugs. Of analysis he is totally ignorant. Yet pharmacists have usurped the title chemist, under the new constitution of the Pharmaceutical Society, a title they are not qualified to have or to hold, as they are not chemists by any stretch of imagination, but merely retailers of chemicals and drugs, and shopkeepers in general. It does not require a chemical degree to measure out half a pint of methylated spirit, or to sell a nail file or powder puff, and, as regards dispensing, it is boiled down to medicinemixing which requires no skill or knowledge of drugs. How many pharmacists know the incompatibilities of amidopyrine? The pharmaceutical diploma is no more than a licence to sell poisons, and it should be kept at that, and a rigid line of demarcation should be drawn between pharmacists, and societies entitled to call themselves chemists. It appears that the new Poisons Act strictly limits the manufacture and selling of poisons to pharmacists, this, of course, is sheer nonsense, for the pharmacist is not qualified to manufacture any more than he is qualified to sell.

It is high time to bring before His Majesty's Privy Council the danger to the public health of allowing pharmacists the sole control of poisons. This should be left in the hands of technical workers and research chemists. The training of a pharmacist occupies the space of nine months. In that time one could not learn to dance properly, yet dangerous drugs and chemicals are entrusted to his care. The training of a chemist occupies five years. He controls the whole life of the nation, safeguards its health, in the laboratories where food and water are tested. The great industries are controlled by chemists, even the railways. The national defence is in his safe keeping, for he makes the ammunition for the guns, the petrol for the motor and aeroplane, yet he may not be able to sell or make poisons. Such a position is an insult to the whole chemical profession.—Yours faithfully,

HUGH G. CORR.

## Superphosphate of Lime

### Increased Customs Duty

THE Treasury, on the recommendation of the Import Duties Advisory Committee, has issued the Additional Import Duties (No. 35) Order, 1934 (S.R. and O., 1934, No. 1,295), increasing the customs duty on superphosphate of lime from 10 per cent. *ad valorem* to an inclusive rate of 10s. per ton, or to 20 per cent. of the value of the goods, whichever is the greater. In its report the committee states that although the proportion of imports to home production is not high, low-grade Continental superphosphate is being delivered at prices which, despite the 10 per cent. duty, are lower than the British cost of production. The committee is satisfied that the ample producing capacity of this fertiliser in this country is not being fully utilised, and that agricultural interests, to whom superphosphate is of considerable value, will not be adversely affected by the new duties. In this latter connection, it is stated that guarantees as to prices have been given which are considered satisfactory. It is also pointed out that an increase in the home production of superphosphate will stimulate the demand for sulphuric acid, the home manufacture of which should be encouraged in the national interest. A White Paper (Cmd. 4,756) containing the Treasury order and the committee's report is published by the Stationery Office. The order came into operation on Monday.

## British Celanese Appeal

### Judgment Reserved in Rayon Patent Case

THE House of Lords (Lord Tomlin, Lord Russell of Killowen, and Lord Macmillan) reserved judgment on November 30 at the conclusion of the hearing of the appeal by the plaintiffs, British Celanese, Ltd., from the judgment of the Court of Appeal, dated June 20, 1933, dismissing their appeal from a decision of Mr. Justice Clauson, dated February 13, 1933, in the action in which they claimed an injunction to restrain the defendants, Courtaulds, Ltd., from the alleged infringement of certain letters patent belonging to the plaintiffs and relating to the manufacture of artificial silk.

The present appeal related to letters patent Nos. 165,519 of 1920 and 198,023 of 1922, the former relating to a process and apparatus for the manufacture of artificial silk, the latter to a process and apparatus for simultaneously twisting the thread and winding the filaments of artificial silk. The respondents denied having infringed the letters patent and counter-claimed for the revocation of the letters patent on the ground of invalidity. Mr. Justice Clauson made an order revoking two Celanese patents on the ground that they had been anticipated by prior specifications and lacked patentable subject matter.

The hearing of the appeal, which opened on October 29, has occupied nineteen days in the House of Lords, as compared with seventeen in the Court of Appeal. Mr. Wilfred Greene spoke for seven and a half days in opening the case for Celanese, Mr. Whitehead replied for Courtaulds in six and a half days, and Sir Stafford Cripps also spoke for a whole day for Courtaulds. Mr. Greene was four days making his final reply.

It is estimated that the costs in the House of Lords will amount to not less than £25,000, while those in the courts below have been estimated at £50,000.

## Dermatitis from Soda Ash

### Danger from Handling Porous Sacks

BEFORE Judge Bensley Wells, at Southwark County Court, on November 29, William Charles Neilson, dock labourer, of 128 Redriff Estate, Rotherhithe, S.E., was the applicant in a Workmen's Compensation Act claim against the Odessa Wharf Co., Ltd., wharfingers and lightermen, of Odessa Street, S.E. He alleged that as the result of handling soda ash from Russia contained in porous sacks he contracted dermatitis on both hands and arms, and asked for an award for the full rate of compensation, and a declaration of liability.

Mr. W. Dockworth, who appeared for the respondents, said that, subject to the Judge's approval, the parties had arrived at a settlement, the applicant to receive a lump sum payment of £40, and the respondents to pay the costs. The respondents had unsuccessfully contested the certifying surgeon's certificate that the applicant was suffering from dermatitis as the result of handling soda ash, and their defence to the present proceedings was that there was no long continuing exposure, which had to be proved under the Act. The applicant had agreed to accept the £40 and, if the Judge approved, it would be better for him to warn the applicant that he should do work that did not bring him into contact with chemicals, or use a strong soap, because he had what was termed an idiosyncrasy, and it was likely to recur. This was most important to the respondents, because if he contracted dermatitis again within 12 months, even though they had settled this claim, they were likely to be brought in to contribute to any compensation to which he might become entitled.

Mr. Morey, for the applicant, agreed there was a difficulty in proving his case, and, after warning the applicant as to the work he undertook in future, His Honour approved the settlement.

UNITED States production of benzol, estimated by the Bureau of Mines, from the production of coke at by-product ovens known to recover benzol, totalled 32,557,000 gallons during the first 9 months of 1934, compared with 45,332,000 gallons in the corresponding period of 1933.

## Continental Chemical Notes

### **Estonia**

THE SHALE OIL AND BENZINE PLANTS of the Estonian State Shale Works at Kochtel are to be enlarged next spring.

### **Portugal**

IN THE ROSIN PRODUCTS INDUSTRY a total production of 40,000 tons of rosin and turpentine is expected for the present year, which compares with 10,000 tons in 1928.

### **Italy**

NEW CHEMICAL ENTERPRISES recently approved by the Ministry of Corporations include opium alkaloids extraction (Soc. S.I.F.A.G., Milan); cinema films (Vis S.A., Tirrenia); soaps, disinfectants, etc. (Italo Bertoni, Milan); metal polishes, insecticides and disinfectants (Salvatore Vito, Alba).

### **Switzerland**

VANILLIN CAN BE SYNTHESISED by a new method patented by the firm of Hoffman-La Roche based upon oxidation, in aqueous alkali solution, of phenols containing the group  $\text{CH}_3\text{CH}=\text{CH}$  in the ortho- or para-position by means of certain nitro aromatic compounds. Oxidation of the sodium compound of isoeugenol, for example, with the sodium salt of nitrobenzene sulphonic acid in alkaline solution leads to the formation of vanillin in high yield.

### **France**

THE TURPENTINE AND ROSIN EXTRACTION INDUSTRY in South East France has deteriorated of recent years, reports the "Chemische Industrie," only three companies being in production at the present time with a total estimated output (1934) of 2,700 hectolitres oil of turpentine and 600 tons rosin. The soap and paint industries of Marseilles (which is also an important centre for rosin distillation products) alone consume annually 4,000 hectolitres oil of turpentine and 10,000 tons rosin.

THE CAMPAGNIE MINES DE BETHUNE, in their report for the year ending June 30 last, make reference to coal liquefaction developments. Following negotiations with the State Research Institute for liquid fuel, a joint experiment plant is to be erected. Among other points from the report: new nitric acid and sodium nitric plants have been operating since November, 1933; the synthetic ammonia output is converted partly to ammonium sulphate and partly to nitrogen fertilisers; a new water-gas generator with a daily capacity of 50,000 cubic metres has been erected; the synthetic ethyl alcohol plant has also been extended.

### **Germany**

CHLORINATED RUBBER is proposed as a lining or packing material for hydrocyanic acid containers (Ger. Pat. 601,640).

A NEW ACETATE SILK FIRM has been formed at Säckingen by the Swiss and German Lonza interests in association with the Reckingen Power Company under the style of Lonsona A.G., for acetate products with an initial capital of four million marks. Production is expected to commence at the beginning of 1935 and will reach 5,000 kg. per day.

THE NEW CO-OPERATIVE ORGANISATION of the German lignite industry (Braunkohle-Benzin A.G.) has commenced activities. Central German lignite to be used for hydrogenation is expected to yield one ton benzine from 15 ton sof raw material, which compares favourably, it is claimed, with the one ton benzine from  $3\frac{1}{2}$  tons anthracite which is the anticipated yield from the I.C.I. hydrogenation plant at Billingham.

A NEW LABORATORY APPARATUS for studying reactions between solids, liquids and gases at high pressure and varying temperatures is described by Agde and Vetter in the "Chemische Fabrik," of November 14. It was evolved in the course of experiments on conversion of aqueous alkali chromate solution into bichromate with the aid of carbon dioxide under pressure. Solid deposits can be separated and clear samples of liquid reaction products withdrawn at the prevailing reaction pressure.

### **Austria**

AN AMBITIOUS SCHEME with a view to recommencing salt production at the Isch and Alt-Aussee mines has been approved by the Austrian Government. It is hoped to open out extensive new deposits.

### **Hungary**

LOW TEMPERATURE CARBONISATION of native lignite with production of coke, motor spirit and oils is being tested on the experimental scale by a Hungarian company ("Industrie Chimique").

### **Russia**

TWO NEW CARBON BLACK FACTORIES have commenced working at Baku, with a daily output of 2.5 tons.

A NEW GRAPHITE FACTORY, capable of an annual output of 4,000 tons, has been erected at Sawalze (Ukraine).

TWELVE ROSIN PRODUCTS FACTORIES now operating in Russia this year will have an output of 50,000 tons rosin and 8,000 tons turpentine.

THE PRODUCTION OF WOOD ALCOHOL in Russia is now in course of expansion, a recent report stating that the annual capacity will shortly amount to 100,000 hectolitres.

## **I. G. Farbenindustrie**

### **Report for the Third Quarter, 1934**

THE report of the German Dye Trust (I. G. Farbenindustrie) for the third quarter of the current year records a further favourable development in domestic trade, but admits that exports are meeting with growing difficulties and in some sections have shown a substantial decline. Both domestic and foreign business appears to have been approximately maintained in the trust's old branches of production, namely, dyes, chemicals, photographic goods, and pharmaceutics.

Chief interest is now centred in the German Dye Trust's new fields of production, particularly those entrusted with the national task of rendering Germany independent of foreign supplies. Although there are said to have been large demands for nitrogen fertilisers for the home market, there was a heavy fall in exports, which is one of the main causes of nitrogen plants with an unutilised capacity henceforth being reorganised for the production of synthetic petrol. The continued extension of the hydrogenation plant at Leuna, which is chiefly working on brown coal, is reported to have resulted in the planned larger production of petrol, while preparations for the operation of a large experimental plant for the hydrogenation of bituminous coal has begun at Ludwigshafen.

Domestic trade in viscose and acetate rayon, as well as in vistra threads, is stated to have shown a continued favourable development, but the respective foreign trade underwent a considerable decline, both in quantity and value, as a result of a keen international competition and the effects of the depreciation of currencies.

### **Boiler Feedwater Treatment**

AN ORGANIC COLLOIDAL FEEDWATER TREATMENT prepared in various grades for specific conditions and controlled by analytical methods, is supplied by Pamolene, Ltd. It contains no acids or strong alkali, is harmless to gaskets, packings, rubber, soft metals and safe to handle. Users find that it does a satisfactory job, that their boilers are clean and free from scale, that corrosion and pitting are arrested, that carry-over and steam contamination are infinitesimal and that the savings effected greatly exceed the cost of the treatment. In one particular case six 200 h.p. coal-fired boilers were using river water and the scale in the tubes would not yield to the rotary cleaner. Pamolene service began in October, 1931, and no tubes have been lost or replaced since that date, whereas tube replacements previously amounted to £80 or £100 annually.

## Weekly Prices of British Chemical Products

### Review of Current Market Conditions

THERE are no changes to report in the general prices of heavy chemicals, wood distillation products, coal tar products, pharmaceutical and photographic chemicals, perfumery chemicals and intermediates, but there have been some slight advances in the price of sandalwood oils, to-day's price for Australian B.P. and French Codex 92/95% qualities being 15s. 6d. per lb. Unless otherwise stated the prices quoted below are for fair quantities net and naked at sellers' works.

**MANCHESTER.**—Neither in the Lancashire cotton nor the Yorkshire woollen industries just now are conditions particularly promising, and in the chemical market here during the past week traders report substantial room for improvement in the rate at which textile chemicals are being taken up in the bleaching, dye-

ing, and finishing industries. With regard to current trading conditions, a few fresh contracts have been added to those already on the books for delivery over varying periods of 1935, but in most other respects business is being conducted on a seasonally restricted scale. Users are taking fairly steady deliveries of materials ordered, but, in consequence of the exigencies of stocktaking, which will be in full swing at many using works within the next few weeks, there is a natural reluctance to add to supplies in store and in many instances specifications are being limited to spot requirements.

**SCOTLAND.**—The Scottish heavy chemical market has definitely slowed down due to most of the prices for the year 1935 not being fixed.

### General Chemicals

ACETONE.—LONDON : £65 to £68 per ton; SCOTLAND : £66 to £68 ex wharf, according to quantity.	CADMIUM SULPHIDE.—2s. 5d. to 2s. 9d.
ACID, ACETIC.—Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s.; tech., 40%, £20 5s. to £21 15s.; tech., 60%, £28 10s. to £30 10s. LONDON : Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s. to £41 5s.; tech., 40%, £20 5s. to £22 5s.; tech., 60%, £29 5s. to £31 5s. SCOTLAND : Glacial 98/100%, £48 to £52; pure 80%, £39 5s.; tech., 80%, £38 5s. d/d buyers' premises Great Britain. MANCHESTER : 80%, commercial, £39; tech. glacial, £52.	CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.
ACID, BORIC.—Commercial granulated, £25 10s. per ton; crystal, £26 10s.; powdered, £27 10s.; extra finely powdered, £29 10s. packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots.	CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.
ACID, CHROMIC.—10½d. per lb., less 24%, d/d U.K.	CARBON BLACK.—3½d. to 5d. per lb. LONDON : 4½d. to 5d.
ACID, CITRIC.—10½d. per lb. less 5%. MANCHESTER : 10½d. to 10¾d.	CARBON TETRACHLORIDE.—SCOTLAND : £41 to £43 per ton, drums extra.
ACID, CRESYLIC.—97/99%, 1s. 8d. to 1s. 9d. per gal.; 98/100%, 2s. to 2s. 2d.	CHROMIUM OXIDE.—10½d. per lb., according to quantity d/d U.K.; green, 1s. 2d. per lb.
ACID, FORMIC.—LONDON : £40 to £45 per ton.	CHROMETAN.—Crystals, 3½d. per lb.; liquor, £19 10s. per ton d/d.
ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND : Arsenical quality, 4s.; dearsenicated, 5s. ex works full wagon loads.	COPPERAS (GREEN).—SCOTLAND : £3 15s. per ton, f.o.r. or ex works.
ACID, LACTIC.—LANCASHIRE : Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £48; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.	CREAM OF TARTAR.—LONDON : £4 2s. 6d. per cwt. SCOTLAND : £4 2s. less 2½ per cent.
ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, SCOTLAND : 80°, £23 ex station full truck loads.	DINITROTOLUENE.—66/68° C., 9d. per lb.
ACID, OXALIC.—LONDON : £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND : 98/100%, £48 to £50 ex store. MANCHESTER : £49 to £54 ex store.	DIPHENYLGUANIDINE.—2s. 2d. per lb.
ACID, SULPHURIC.—SCOTLAND : 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.	FORMALDEHYDE.—LONDON : £25 10s. per ton. SCOTLAND : 40%, £25 to £28 ex store.
ACID, TARTARIC.—1s. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards.	IODINE.—Resublimed B.P., 6s. 3d. to 8s. 4d. per lb.
ALUM.—SCOTLAND : Lump potash, £8 10s. per ton ex store.	LAMPBLACK.—£45 to £48 per ton.
ALUMINA SULPHATE.—LONDON : £7 10s. to £8 per ton. SCOTLAND : £7 to £8 ex store.	LEAD ACETATE.—LONDON : White, £34 10s. per ton; brown, £1 per ton less. SCOTLAND : White crystals, £33 to £35; brown, £1 per ton less. MANCHESTER : White, £34; brown, £32.
AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND : 10d. to 1s. containers extra and returnable.	LEAD NITRATE.—£27 10s. per ton.
AMMONIA, LIQUID.—SCOTLAND : 80°, 2½d. to 3d. per lb., d/d.	LEAD, RED.—SCOTLAND : £24 to £26 per ton less 2½%; d/d buyer's works.
AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.	LEAD, WHITE.—SCOTLAND : £39 per ton, carriage paid. LONDON : £36 10s.
AMMONIUM CARBONATE.—SCOTLAND : Lump, £30 per ton; powdered, £33, in 5-cwt. casks d/d buyers' premises U.K.	LITHOPONE.—30%, £7 to £17 10s. per ton.
AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON : Fine white crystals, £18 to £19. (See also Salammoniac.)	MAGNESITE.—SCOTLAND : Ground calcined, £9 per ton, ex store.
AMMONIUM CHLORIDE (MURIATE).—SCOTLAND : British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)	METHYLATED SPIRIT.—61 O.P. Industrial, 1s. 6d. to 2s. 1d. per gal. Pyridinized industrial, 1s. 8d. to 2s. 3d. Mineralized, 2s. 7d. to 3s. 1d. 64 O.P. Id. extra in all cases. Prices according to quantities. SCOTLAND : Industrial 64 O.P., 1s. 9d. to 2s. 4d.
ANTIMONY OXIDE.—SCOTLAND : Spot, £34 per ton, c.i.f. U.K. ports.	NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.
ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.	NICKEL SULPHATE.—£49 per ton d/d.
ARSENIC.—LONDON : £16 10s. per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND : White powdered, £23 ex wharf. MANCHESTER : White powdered Cornish, £22 ex store.	PHENOL.—8d. to 8½d. per lb. without engagement.
ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.	POTASH, CAUSTIC.—LONDON : £42 per ton. MANCHESTER : £38.
BARIUM CHLORIDE.—£11 per ton. SCOTLAND : £10 10s.	POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per net d/d U.K. Discount according to quantity. Ground 5½d. LONDON : 5d. per lb. with usual discounts for contracts. SCOTLAND : 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER : 5d.
BARYTES.—£6 10s. to £8 per ton.	POTASSIUM CHLORATE.—LONDON : £37 to £40 per ton. SCOTLAND : 99/100%, powder, £37. MANCHESTER : £38.
BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.	POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.
BLEACHING POWDER.—Spot, 35/37%, £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND : £8 in 5/6 cwt. casks for contracts over 1934/1935.	POTASSIUM IODIDE.—B.P., 5s. 2d. per lb.
BORAX, COMMERCIAL.—Granulated, £14 10s. per ton; crystal, £15 10s.; powdered, £16; finely powdered, £17; packed in 1-cwt. bags, carriage paid home to buyer's premises within the United Kingdom in 1-ton lots.	POTASSIUM NITRATE.—SCOTLAND : Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.
	POTASSIUM PERMANGANATE.—LONDON : 9d. per lb. SCOTLAND : B.P. crystals, 9d. MANCHESTER : B.P., 10d.
	POTASSIUM PRUSSIATE.—LONDON : 8½d. to 8¾d. per lb. SCOTLAND : Yellow spot, 8½d. ex store. MANCHESTER : Yellow, 8½d.
	SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels.
	SODA ASH.—56% spot, £5 15s. per ton f.o.r. in bags.
	SODA, CAUSTIC.—Solid 76/77° spot, £13 17s. 6d. per ton d/d station. SCOTLAND : Powdered 98/99%, £17 10s. in drums, £18 5s. in casks. Solid 76/77°, £14 10s. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER : £13 5s. to £14 contracts.
	SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.
	SODIUM ACETATE.—£22 per ton. LONDON : £23.
	SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND : Refined recrystallised £10 15s. ex quarry or station. MANCHESTER : £10 10s.
	SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per

**lb.** LONDON : 4d. per lb. net for spot lots and 4d. per lb. with discounts for contract quantities. SCOTLAND : 4d. delivered buyer's premises with concession for contracts.  
**SODIUM BISULPHITE POWDER.**—60/62%, £18 10s. per ton d/d 1-cwt, iron drums for home trade.  
**SODIUM CARBONATE (SODA CRYSTALS).**—SCOTLAND : £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.  
**SODIUM CHLORATE.**—£32 10s. per ton.  
**SODIUM CHROMATE.**—4d. per lb. d/d U.K.  
**SODIUM HYPOSULPHITE.**—SCOTLAND : Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £14 10s. ex station, 4-ton lots. MANCHESTER : Commercial, £10 5s.; photographic, £15.  
**SODIUM META SILICATE.**—£16 per ton, d/d U.K. in cwt. bags.  
**SODIUM IODIDE.**—B.P., 6s. per lb.  
**SODIUM NITRITE.**—LONDON : Spot, £18 to £20 per ton d/d station in drums.  
**SODIUM PERBORATE.**—LONDON : 10d. per lb.  
**SODIUM PHOSPHATE.**—£13 per ton.  
**SODIUM PRUSSIATE.**—LONDON : 5d. to 5½d. per lb. SCOTLAND : 5s. to 5½d. ex store. MANCHESTER : 4½d. to 5d.  
**SULPHUR.**—£9 15s. to £10 per ton. SCOTLAND : £8 to £9.  
**SODIUM SILICATE.**—140° Tw. Spot £8 per ton. SCOTLAND : £8 10s.  
**SODIUM SULPHATE (GLAUBER SALTS).**—£4 2s. 6d. per ton d/d SCOTLAND : English material £3 15s.  
**SODIUM SULPHIDE**—Solid 60/62% Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. SCOTLAND : For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d., d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER : Concentrated solid, 60/62%, £11; commercial, £8 2s. 6d.  
**SODIUM SULPHITE.**—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot, £9 10s. d/d station in bags.  
**SULPHATE OF COPPER.**—MANCHESTER : £14 7s. 6d. per ton f.o.b.

### Coal Tar Products

**ACID, CARBOLIC.**—Crystals, 8½d. to 8½d. per lb.; crude, 60's, to 2s. 2½d. per gal. MANCHESTER : Crystals, 7½d. per lb.; crude, 1s. 11d. per gal. SCOTLAND : 60's, 2s. 6d. to 2s. 7d.  
**ACID, CRESYLIC.**—90/100%, 1s. 8d. to 2s. 3d. per gal.; pale 98%, 1s. 6d. to 1s. 7d.; according to specification. LONDON : 98/100%, 1s. 4d.; dark, 95/97%, 1s. SCOTLAND : Pale, 99/100%, 1s. 3d. to 1s. 4d.; dark, 97/99%, 1s. to 1s. 1d.; high boiling acid, 2s. 6d. to 3s.  
**BENZOL.**—At works, crude, 9d. to 9½d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4d. to 1s. 4½d. pure, 1s. 7½d. to 1s. 8d. LONDON : Motor, 1s. 6½d. SCOTLAND : Motor, 1s. 6½d.  
**CREOSOTE.**—B.S.I. Specification standard, 4d. to 4½d. per gal. f.o.r. Home, 3½d. d/d. LONDON : 3½d. f.o.r. North; 4d. London. MANCHESTER : 3½d. to 4½d. SCOTLAND : Specification oils, 4d.; washed oil, 4½d. to 4¾d.; light, 4½d.; heavy, 4½d. to 4¾d.  
**NAPHTHA.**—Solvent, 90/160%, 1s. 6d. to 1s. 7d. per gal.; 95/160%, 1s. 7d.; 99%, 11d. to 1s. 1d. LONDON : Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND : 90/160% 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.  
**NAPHTHALENE.**—Purified crystals, £10 per ton in bags. LONDON : Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND : 40s. to 50s.; whizzed, 70s. to 75s.  
**PITCH.**—LONDON : 50s. per ton f.o.b. East Coast port.  
**PYRIDINE.**—90/140, 7s. to 8s. 6d. per gal.; 90/180, 2s. 3d.  
**TOLUOL.**—90%, 1s. 10d. to 1s. 11d. per gal.; pure, 2s. 2d. to 2s. 3d.  
**XYLOL.**—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 1d. to 2s. 2d.

### Intermediates and Dyes

**ACID, BENZOIC.** 1914 B.P. (ex Toluol).—1s. 9½d. per lb.  
**ACID, GAMMA.**—Spot, 4s. per lb. 100% d/d buyer's works.  
**ACID, H.**—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.  
**ACID NAPHTHIONIC.**—1s. 8d. per lb.  
**ACID, NEVILLE AND WINTHER.**—Spot, 3s. per lb. 100%.  
**ACID, SULPHANILIC.**—Spot, 8d. per lb. 100% d/d buyer's works.  
**ANILINE OIL.**—Spot, 8d. per lb., drums extra, d/d buyer's works.  
**ANILINE SALTS.**—Spot, 8d. per lb. d/d buyer's works, casks free.  
**BENZALDEHYDE.**—Spot, 1s. 8d. per lb., packages extra.  
**BENZIDINE BASE.**—Spot, 2s. 5d. per lb., 100% d/d buyer's works.  
**BENZIDINE HCl.**—2s. 5d. per lb.  
**n-CRESOL.** 34-5° C.—2s. per lb. in ton lots.  
**m-CRESOL.** 98/100%.—2s. 3d. per lb. in ton lots.  
**DICHLORANILINE.**—1s. 11½d. to 2s. 3d. per lb.  
**DIMETHYLANILINE.**—Spot, 1s. 6d. per lb., package extra.  
**DINITROBENZENE.**—8d. per lb.  
**DINITROTOLUENE.**—48/50° C., 9d. per lb.; 66/68° C., 0½d.  
**DINITROCHLOROBENZENE, SOLID.**—£72 per ton.  
**DIPHENYLAMINE.**—Spot, 2s. per lb., d/d buyer's works.  
**α-NAPHTHOL.**—Spot, 2s. 4d. per lb., d/d buyer's works.  
**β-NAPHTHOL.**—Spot, £78 15s. per ton in paper bags.

**α-NAPHTHYLAMINE.**—Spot, 11½d. per lb., d/d buyer's works.  
**β-NAPHTHYLAMINE.**—Spot, 2s. 9d. per lb., d/d buyer's works.  
**o-NITRANILINE.**—3ss, 11d. per lb.  
**m-NITRANILINE.**—Spot, 2s. 7d. per lb., d/d buyer's works.  
**p-NITRANILINE.**—Spot, 1s. 8d. per lb., d/d buyer's works.  
**NITROBENZENE.**—Spot, 4½d. to 5d. per lb.; 5-cwt. lots, drums extra.  
**NITRONAPHTHALENE.**—9d. per lb.; P.G., 1s. 0½d. per lb.  
**SODIUM NAPHTHIONATE.**—Spot, 1s. 9d. per lb.  
**o-TOLUIDINE.**—9½d. to 11d. per lb.  
**p-TOLUIDINE.**—1s. 11d. per lb.

### Nitrogen Fertilisers

**SULPHATE OF AMMONIA.**—Dec., £7 0s. 6d.; Jan., 1935, £7 2s.; Feb., £7 3s. 6d.; Mar./June, £7 5s.; for neutral quality basis 20.6% nitrogen delivered in 6-ton lots to farmer's nearest station.  
**CYANAMIDE.**—Dec., £7; Jan., 1935, £7 1s. 3d.; Feb., £7 2s. 6d.; Mar., £7 3s. 9d.; Apr./June, £7 5s.; delivered in 4-ton lots to farmer's nearest station.  
**NITRATE OF SODA.**—£7 12s. 6d. per ton for delivery to June, 1935, in 6-ton lots, carriage paid to farmer's nearest station for material basis 15.5% or 16% nitrogen.  
**NITRO-CHALK.**—£7 5s. per ton to June, 1935, in 6-ton lots carriage paid to farmer's nearest station for material basis 15.5% nitrogen.  
**CONCENTRATED COMPLETE FERTILISERS.**—£10 5s. to £10 17s. 6d. per ton according to percentage of constituents, for delivery up to June, 1935, in 6-ton lots carriage paid to farmer's nearest station.  
**NITROGEN PHOSPHATE FERTILISERS.**—£10 5s. to £13 15s. per ton, for delivery up to June, 1935, in 6-ton lots carriage paid to farmer's nearest station.

### Latest Oil Prices

LONDON, December 5.—**LINSEED OIL** was firmer. Spot, £20 15s. (small quantities, 30s. extra); Dec., £19 7s. 6d.; Jan.-April, £19 12s. 6d.; May-Aug., £20 2s. 6d.; Sept.-Dec., £20 10s., naked. **SOYA BEAN OIL** was steady. Oriental (bulk), Dec.-Jan. shipment, £17 10s. per ton. **RAPE OIL** was firm. Crude, extracted, £28; technical refined, £29 10s., naked, ex wharf. **COTTON OIL** was dearer. Egyptian, crude, £19; refined common edible, £23 10s.; and deodorised, £25, naked, ex mill (small lots 30s. extra). **TURPENTINE** was quiet. American, spot, 44s. 3d. per cwt.

HULL.—**LINSEED OIL**, spot, quoted £20 per ton; Dec., £19 12s. 6d.; Jan.-April, £19 17s. 6d.; May-Aug., £20 2s. 6d.; Sept.-Dec., £20 10s., naked. **COTTON OIL**, Egyptian, crude, spot, £19 10s.; edible, refined, spot, £21; technical, spot, £21; deodorised, £23, naked. **PALM KERNEL OIL**, crude, f.m.q., spot, £16, naked. **GROUNDNUT OIL**, extracted, spot, £25; deodorised, £29. **RAPE OIL**, extracted, spot, £27; refined, £28 10s. **SOYA OIL**, extracted, spot, £18 10s.; deodorised, £21 10s. per ton. **COD OIL** (industrial), 25s. per cwt. **CASTOR OIL**, pharmaceutical, 37s.; first, 32s.; second, 29s. per cwt. **TURPENTINE**, American, spot, 46s. per cwt.

### Retail Chemists' Proposed Merger

#### Timothy Whites and Taylors

TERMS were announced on Thursday of a proposal for the absorption by Timothy Whites of Taylors (Cash Chemists) Trust and Taylors (Cash Chemists), London. Under the agreement provisionally reached Timothy Whites offer to purchase for cash the whole of the preferred ordinary shares of the two Taylor companies at 10s. a share in cash, and to purchase the whole of the deferred ordinary shares (not already owned by the purchasing company) at 9d. a share in cash. Alternatively, those to whom the offer is made are given the right to apply the cash receivable under the plan in the purchase of ordinary 5s. shares in Timothy Whites at a premium of 15s. a share. Those accepting this alternative offer would be allotted one 5s. ordinary share in Timothy Whites for every two preferred ordinary shares, or approximately one ordinary share of that company for every 27 deferred ordinary shares held. Timothy Whites also offer to purchase the whole of the outstanding funding certificates of Taylors (Cash Chemists), London, for cash at par. It is stated that the merger will probably result in economies of approximately £40,000 a year, and when these economies become effective a dividend on the ordinary shares of Timothy Whites of 25 per cent. should be reasonable. For the past year this company is paying 17½ per cent. Timothy Whites are shortly to submit a proposal for the creation and issue of £1,000,000 four per cent. debenture stock, of which about £500,000 will be required to discharge existing mortgages and the balance will be available to finance the purchase of additional branches and the development and reconstruction of existing properties.

## Inventions in the Chemical Industry

### Patent Specifications and Applications

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

#### Complete Specifications Open to Public Inspection

- CHLORINATED RUBBER, production.—Chemische Fabrik Buckau. May 26, 1933. 11724/34.
- SUPERFATTED SOAPS, shaving creams, and similar masses, manufacture.—Henkel et Cie, Ges. May 20, 1933. 14953/34.
- AZO DYESTUFFS insoluble in water, manufacture.—I. G. Farbenindustrie. May 23, 1933. 15057/34.
- VINYL ESTERS, manufacture.—I. G. Farbenindustrie. May 20, 1933. 15302/34.
- NITROGENOUS CONDENSATION PRODUCTS derived from phenols, manufacture.—Soc. of Chemical Industry in Basle. May 24, 1933. 15303/34.
- AZO DYESTUFFS, manufacture.—M. J. G. Bader. May 20, 1933. 15323/34.
- ACID CALCIUM LACTATES and methods of preparing same.—Royal Baking Powder Co. May 23, 1933. 15384/34.
- SEPARATION OF OIL from oil-containing substances.—K. Sohler. May 26, 1933. 15512/34.
- ARTIFICIAL MASSES, manufacture.—Soc. of Chemical Industry in Basle. May 26, 1933. 15529/34.
- VAT DYE COMPOSITIONS.—National Aniline and Chemical Co., Inc. May 26, 1933. 15649/34.
- HIGHER ALKYL ESTERS of the carboxylic acids, preparation.—E. I. du Pont de Nemours and Co. May 25, 1933. 15658/34.
- RESORCINOL, production.—E. I. du Pont de Nemours and Co. May 26, 1933. 15915/34.
- ORGANIC CYANOGEN COMPOUNDS, manufacture.—E. I. du Pont de Nemours and Co. May 26, 1933. 15916/34.
- AMINES, manufacture.—E. I. du Pont de Nemours and Co. May 26, 1933. 15917/34.
- CHEMICAL PROCESS.—E. I. du Pont de Nemours and Co. May 26, 1933. 15918/34.

#### Specifications Accepted with Dates of Application

- COMPOUNDS OF THE ACRIDINIUM SERIES, manufacture.—I. G. Farbenindustrie. May 13, 1933. 419,632.
- ALKALI SULPHIDES, manufacture.—W. W. Groves (Naamlooze Vennootschap Stikstofbindingsindustrie Nederland). Dec. 28, 1933. 419,567.
- RECOVERY OF ELEMENTAL SULPHUR.—H. G. C. Fairweather (M. Guggenheim, S. R. Guggenheim, S. Guggenheim, E. A. C. Smith, S. W. Howland, and M. G. B. Whelpley, trading as Guggenheim Bros.). Feb. 24, 1934. 419,788.
- MONOCALCIUM PHOSPHATE, production.—Kali-Forschungs-Anstalt Ges. March 31, 1933. 419,641.
- CADMIUM, process for producing.—American Smelting and Refining Co. March 29, 1933. 419,507.
- TREATING SULPHATE SOLUTIONS of thallium and cadmium.—American Smelting and Refining Co. March 29, 1933. 419,508.
- MONOAZO DYESTUFFS and intermediate compounds used in their manufacture, process for the manufacture.—L. S. E. Ellis (Chemical Works, formerly Sandoz). March 26, 1934. 419,583.
- RIPENING ALKALI CELLULOSE, process.—I. G. Farbenindustrie. June 27, 1933. 419,585.
- REACTION PRODUCTS OF ALIPHATIC AMINES, process for the manufacture.—I. G. Farbenindustrie. March 2, 1932. 419,588.
- SULPHUR PREPARATIONS for use as insecticides, fungicides, and ovicides.—R. C. McQuiston. Dec. 17, 1932. 420,068.
- DYESTUFF PREPARATIONS, manufacture.—A. Carpmael (I. G. Farbenindustrie). May 9, 1933. 419,817.
- TEXTILE ASSISTANTS.—Imperial Chemical Industries, Ltd., and H. A. Piggott. May 15, 1933. 419,942.
- DYESTUFF INTERMEDIATES.—Imperial Chemical Industries, Ltd., A. W. Baldwin, R. W. Everatt, and A. H. Knight. May 17, 1933. 419,945.
- ACETIC ACID and its derivatives, manufacture.—E. I. du Pont de Nemours and Co., and J. W. Lawrie. May 17, 1933. 419,946.
- RESINOUS COMPOSITIONS.—British Resin Products, Ltd., and H. E. Mabey. May 18, 1933. 419,883.
- NATURAL RESINS AND GUMS, treatment.—H. L. Frenkel. May 22, 1933. 419,952.
- NICKEL-IRON ALLOYS, manufacture.—Telegraph Construction and Maintenance Co., Ltd., H. J. Garnett and F. H. Smith. May 22, 1933. 419,953.
- 1,4-DIAMINO-ANTHRAQUINONE-2,3-X-TRISULPHONIC ACIDS, process for manufacture.—I. G. Farbenindustrie. May 23, 1932. 419,954.
- CELLULOSE ESTERS, manufacture.—E. I. du Pont de Nemours and Co. May 25, 1932. 420,092.

VAT AND SULPHUR DYESTUFF PREPARATIONS for textile printing, manufacture.—I. G. Farbenindustrie. May 26, 1932. 420,095.

CELLULOSE DERIVATIVES, manufacture.—H. Dreyfus. May 26, 1933. 420,099.

TITANIUM OXIDE, manufacture.—Intermetal Corporation. June 17, 1932. 420,105.

LAMINATED PRODUCTS, manufacture.—Soc. of Chemical Industry in Basle. Oct. 15, 1932. 419,901.

DYESTUFFS OF THE ANTHRAQUINONE SERIES, manufacture.—G. B. Ellis (Chemical Works, formerly Sandoz). Dec. 8, 1933. 419,990.

CONVERTING SOLID CARBON DIOXIDE into its gaseous condition, means.—J. Mosonyi. Dec. 15, 1932. 419,904.

AMMONIUM SULPHATE, manufacture.—Union Chimique Belge Soc. Anon., and J. Guillissen. Dec. 17, 1932. 419,844.

STAPLE FIBRE, manufacture.—Soc. of Chemical Industry in Basle. March 29, 1933. 419,918.

PYROPHOSPHORIC ACID ESTERS, manufacture and application.—H. T. Böhme A.-G. July 3, 1933. 419,868.

POLYVINYL ALCOHOLS, manufacture of shaped articles.—Consoritum für Elektro-Chemische Industrie Ges. Oct. 17, 1932. 420,052.

HEAT-RESISTING BOROSILICATE GLASS, transparent.—R. Hadden (Corning Glass Works). June 27, 1934. 420,054.

#### Applications for Patents

(November 22 to 28 inclusive.)

CONCENTRATING RUBBER LATEX.—Aktiebolaget Separator. 33712.

ZINC OXIDE, process of making.—American Zinc, Lead and Smelting Co. (United States, Dec. 13, '33.) 33873.

EXTRACT OF LEMON IN POWDER, preparation.—Arenalla Soc. Italiana per l'Industria dell'Acido Citrico ed Affini. (Italy, Nov. 29, '33.) 33692.

ELECTROLYTIC DEPOSITION OF COBALT.—H. M. J. Berger. 33697.

BASIC ESTERS OF POLYARYLACETIC ACIDS, manufacture.—A. G. Bloxam (Soc. of Chemical Industry in Basle). 33727.

CYCLIC KETONES OF THE AETOCHOL ANONE-(17) SERIES, manufacture.—A. G. Bloxam (Soc. of Chemical Industry in Basle). 34079.

ANTISEPTIC GERMICIDAL SUBSTANCES, manufacture.—Boat's Pure Drug Co., Ltd., and J. Marshall. 33647.

DERIVATIVES OF PYRAZOLINE, manufacture.—Boat's Pure Drug Co., Ltd., and H. B. Nisbet. 33774.

N-HYDROXY-ALKYLAMINO-NITRO-AND-AMINOBENZENES, manufacture.

A. Carpmael (I. G. Farbenindustrie). 34233.

DERIVATIVES OF STEROLS, manufacture.—A. Carpmael (Schering-Kahlbaum A.-G.). 33639.

SHREDDED GLASS, production.—Chance Bros. and Co., Ltd., and A. L. Forster. 33678.

VINYL ALCOHOL, manufacture.—Chemische Forschungsges. (Germany, Nov. 25, '33.) 33840.

AZO DYESTUFFS.—M. A. Dahlen, E. I. du Pont de Nemours and Co., and R. E. Eigelmiller. 34252.

COMPOUNDS OF SULPHHYDRYL KERATINIC ACID, etc., process for making.—R. Fleischmann, E. Möller, E. Sturm, J. A. Wülfing, and R. von Wülfing. 34107.

CATALYSTS.—H. W. F. Gifford. 33845.

DISSOLVING PRECIPITATES OF INORGANIC METAL SALTS.—W. W. Groves (I. G. Farbenindustrie). 33726.

DYESTUFF-SULPHONIC ACIDS, manufacture.—W. W. Groves (I. G. Farbenindustrie). 33728.

PRECIPITATES OF INORGANIC METAL SALTS insoluble in water, process of preventing, etc.—W. W. Groves (I. G. Farbenindustrie). 33964.

COMPOUNDS of 1-phenyl-2,3-dimethyl-4-isopropyl-5-pyrazolone, manufacture.—F. Hoffmann-La Roche and Co. (Germany, Jan. 8.) 34061.

ARSENOBENZENE-MONOSULPHONYLATES, manufacture.—I. G. Farbenindustrie. (Germany, Dec. 19, '33.) 33847. (Germany, March 10.) 33848.

AZO DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, Nov. 25, '33.) 33857.

MANGANEUS PHOSPHATE DIHYDRATE, manufacture.—I. G. Farbenindustrie. (Germany, Nov. 28, '33.) 34081.

3-AMINO-QUINOLINES, manufacture.—I. G. Farbenindustrie. (Germany, Dec. 15, '33.) 34189.

DIAZO SALT PREPARATIONS.—Imperial Chemical Industries, Ltd., and M. Wyler. 33648.

CARBOXYLIC ACIDS, manufacture.—Imperial Chemical Industries, Ltd., A. Kershaw and M. Wyler. 34254.

CHLORINATED RUBBER PRODUCTS, production.—Imperial Chemical Industries, Ltd. 34255.

**RESINOUS PRODUCTS.**—Imperial Chemical Industries, Ltd. 34256.  
**AZO DYESTUFFS**, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 33607.  
**ACETALDRHYDE**, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 33608.  
**COMPOUNDS** of the coeranthrene, etc., series, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 33609.  
**CARBON BLACK**, production.—J. Y. Johnson (I. G. Farbenindustrie). 33951.  
**REMOVAL OF CARBONACEOUS COMPOUNDS** from air.—J. Y. Johnson (I. G. Farbenindustrie). 33952.

**AZO DYESTUFFS**, production.—J. Y. Johnson (I. G. Farbenindustrie). 33953.

**SODIUM ALUMINATE**, manufacture.—J. Y. Johnson (Pennsylvania Salt Manufacturing Co.). 34060.

**SEPARATION OF THORIUM AND ZIRCONIUM** from metals, etc.—P. Krishnamurti. 33879.

**AQUEOUS HYDROCHLORIC ACID SOLUTIONS**, evaporation, etc.—Dr. F. Raschig, Ges. (Germany, Nov. 27, '33.) 33633.

**CYCLIC AMINES**, manufacture.—Soc. of Chemical Industry in Basle. (Switzerland, Nov. 25, '33.) 33841. (Switzerland, June 30.) 33842.

## From Week to Week

THE OFFICES, WORKS AND WAREHOUSES of Howards and Sons, Ltd., Ilford, will be closed for the Christmas holidays on Monday, Tuesday and Wednesday, December 24, 25, and 26.

FIRE BROKE OUT AT THE REFINERY of the Standard Oil Co., Havana (Cuba), on November 29. The whole of the building and the storage tanks were in flames.

PROFESSOR J. B. S. HALDANE, F.R.S., delivered the tenth annual Norman Lockyer Lecture of the British Science Guild, at Goldsmiths' Hall, London, on November 28, his subject being "Human Biology and Politics."

THE BILLINGHAM-ON-Tees URBAN DISTRICT COUNCIL has granted a licence to Imperial Chemical Industries, Ltd., for the storage of 70,000 gallons of benzol in connection with the coal-oil plant, now under construction.

MR. C. WALLIS, of 70a Basinghall Street, E.C., was appointed receiver and manager of Harris and Lee, Ltd., chemical manufacturers, on November 27, under powers contained in debentures dated August 11, 1933.

SPEAKING AT THE 272ND ANNIVERSARY DINNER of the Royal Society at the Mayfair Hotel, London, Sir Frederick Gowland Hopkins, the president, said the capital funds of the society were now well over £600,000, and £25,000 had been allotted this year for research work over a wide field of endeavour.

THE IMPORT DUTIES ADVISORY COMMITTEE has received an application for an increase in the import duty on compound fertilisers, mixed fertilisers, and compound manures in powder or granular form, imported in bags or in bulk. Representations should be addressed in writing to the secretary, Import Duties Advisory Committee, Caxton House (West Block), Tothill Street, Westminster, London, S.W.1, not later than December 22.

THE ANNUAL DINNER AND DANCE of the Society of Glass Technology will be held at the Trocadero Restaurant, London, on Tuesday, January 8, 1935, at 7.15 p.m. Tickets, price 15s. each (including gratuities but excluding wines), can be obtained on application to the Secretary, Society of Glass Technology, Darnall Road, Sheffield, 9. The annual dinner of the London Section will be held at the Old Bell Restaurant, Holborn, on Wednesday, December 12, at 7 p.m. Tickets, price 4s. 6d. (exclusive of wines and gratuities) are to be obtained from the hon. secretary of the London Section, Mr. T. C. Crawhall, M.Sc., The Science Museum, South Kensington, London, S.W.7.

THE FEDERATION OF BRITISH INDUSTRIES has addressed a letter to the Minister of Transport viewing with considerable alarm the Electricity (Supply) Bill from the point of view of the overthrow of the principle that the functions of the bodies set up by Parliament for the development of electricity supply—the Electricity Commissioners and the Central Electricity Board—should be for promoting and co-ordinating the supply of electricity through existing undertakings and not for direct trading purposes. The Bill upsets this basic position in that it provides for direct trading to consumers, which although limited in the present Bill to railways and railway works, will, by establishing a precedent, lead eventually to a wide semi-state trading without any direct commercial control or economic safeguard. One of the resulting dangers of granting even limited trading powers to the Board is that it is most likely to lead to an unfavourable reaction on all other classes of consumers, particularly industrial. Ample facilities exist for any railway undertaking to obtain its supplies from authorised undertakers as shown by past and present experience, and as the Bill is apparently not called for by the railway companies, mine owners and others who have railway powers, the reason for its introduction is not obvious. It is suggested that a Bill of such great consequence technically and economically can hardly be dealt with adequately under normal Parliamentary procedure and, therefore, should be subject matter for examination by a select committee which would allow of the merits and demerits of the case being fully examined.

THE PATERSON ENGINEERING CO., LTD., proposes to increase its capital to £200,000 by creating 100,000 new £1 shares, of which 72,000 will be 5½ per cent. cumulative preference shares.

GERMANY HAS SIGNED AN AGREEMENT with Chile under which Germany agrees to import, during a period of six months ending June 30, 1935, a total of 80,000 tons of nitrate from Chile, the purity of which must be guaranteed.

THE NOMINAL CAPITAL of Catalysts, Ltd., chemists, metallurgists, general and consulting engineers, etc., 12 Gray's Inn Road, W.C.1, has been increased by the addition of £2,000 in £1 ordinary shares beyond the registered capital of £10,000.

THE "LONDON GAZETTE" of November 30, announced that a winding-up order had been made on November 26, in the case of British Coal Refining Processes, Ltd., 3-Central Buildings, Westminster, S.W.1.

THE SULPHIDE CORPORATION announces that the disposal of the Seaton Carew Works and the remaining short life of the Central Mine have necessitated consideration of a capital reconstruction scheme. Proposals will, therefore, be submitted as soon as possible.

THE DIRECTORS of Coal and Allied Industries, Ltd., have decided not to close the lists for application for new shares until next Tuesday, December 11. This decision has been reached in consideration of the fact that negotiations for the sale of rights to operate a plant abroad (as referred to by the chairman in his speech at the annual meeting on November 14), are likely to be concluded in the immediate future.

A DISCUSSION on "Automatic Control of Gas, Coke, Oil and Coal Firing for Domestic and other small Boilers," will be opened by Dr. F. M. H. Taylor, Mr. W. A. Hubbard and Mr. J. E. O'Brien, at an informal meeting of the Institute of Fuel next Thursday, December 13, at Bush House, Aldwych, W.C.2, at 7 p.m. The chair will be taken by Mr. H. L. Pirie, chief engineer of the Coal Utilisation Council.

IMPERIAL CHEMICAL INDUSTRIES, LTD., have planned to erect a hydrogenation plant for the extraction of oil from coal in Scotland. The directors have had the scheme, which may cost £10,000,000, under consideration for some time, the intention being to establish a plant similar to the Billingham plant, for the manufacture and distribution to all parts of Scotland of heavy oil. Experiments are now being made at Billingham. The Grangemouth area will probably be selected as the most suitable site, being convenient for all the Scottish coalfields.

OF THE TEN EXPERIMENTAL non-skid sections on the new Kirkham By-Pass (on the Preston-Blackpool road) which Mr. Hore-Belisha, the Minister of Transport, officially opened on Tuesday, two sections, each of about 300 yards in length, were laid by the British Road Tar Association under the aegis of the Ministry of Transport. The surfacing of one of the sections consists of two-coat tarmacadam; while that of the other is carried out in single-coat tar-concrete, British stone and British tar being employed throughout.

UNWRUGHT ALLOYS OR MIXTURES OF METAL, in blocks, ingots, cakes, bars, and slabs (whether broken or not), containing more than 20 per cent. by weight of tin have been added to the Free List. A number of firms in this country are engaged in the recovery of tin from imported scrap material, which, for convenience of transport, is frequently melted down abroad and roughly moulded into blocks, containing varying percentages of tin, the final refining process being undertaken in this country. This material is not covered by the existing free list heading "Scrap Metals and Wastes Fit Only for the Recovery of Metal," and is, therefore, chargeable with the general *ad valorem* duty. In consequence of this increase in the cost there has been a tendency for supplies to be diverted to countries where the smelters are not burdened with a duty.

## Company News

**W. and T. Avery.**—A dividend of 5 per cent. has been declared on the ordinary shares, less tax, payable on January 1.

**British Tar Products.**—In the year ended September 30, the profit amounted to £51,819. The year's dividend of 10 per cent. and bonus of 5 per cent. on the ordinary and preferred ordinary shares remains unchanged, and the sum of £3,477 is carried forward, against £1,423 brought in.

**British Mannesmann Tube Co.**—The trading profit for the year to June 30, 1934, amounted to £57,240, after charging £75,000 depreciation in respect of the current year and also amount towards previous years (£19,844); other income stands at £3,858, less fees, £3,000; debenture interest, £28,838. The debit has been reduced from £749,654 to £720,394.

**Sulphide Corporation.**—The accounts for the year ended June 30, 1934, show a net profit of £45,637, against £37,817 in 1932-1933, after providing £19,131 for amortisation and £43,408 for maintenance. The directors recommend a dividend of 2½ per cent. on the preference shares, which will absorb £15,000, and further recommend that the balance of profit be carried to accumulated profits account. The annual meeting will be held at Winchester House, London, E.C.2, on December 14, at 12 noon.

**Power-Gas Corporation.**—For the year to September 30 last, the report shows a balance of £14,416; to reserve is placed £2,000. The amount brought forward was £11,723, making £24,138. A dividend of 4 per cent., less tax, is paid, leaving to be carried forward, £12,138. The annual meeting will be held at 39 Victoria Street, London, on December 12, at 12 noon.

**Zinc Corporation.**—The directors have declared an interim participating dividend of 6d. per share on both the £1 preference (2½ per cent.) and 10s. ordinary shares (5 per cent.) in respect of 1934. Both these dividends, which are at the same rate as a year ago, will be paid on January 1, 1935, in English currency. The fixed cumulative dividend on the preference shares has also been declared. For 1933 a total of 12½ per cent. was paid on the ordinary, while 6½ per cent. was paid on the preference shares in addition to the fixed dividend of 20 per cent.

**Timothy Whites, Ltd.**—Trading profits, including dividends from subsidiaries, for the year ended September 29 amounted to £203,579, against £201,504 for 1932-33, out of which £17,268, against £18,925, is provided for depreciation and £35,742, against £45,641, for taxation. The preferred ordinary share dividend requires £96,370. It is proposed to increase the final dividend on the deferred ordinary shares from 10 per cent. to 12½ per cent., making the total payment for the year 17½ per cent., against 15 per cent., while the balance forward is increased from £19,127, the net amount brought in to £29,411. The interest in the subsidiaries is shown at £439,084, against £523,374. Floating assets total £484,168, against current liabilities, excluding the amount owing to subsidiaries, of £219,266.

**Taylor's (Cash Chemists) Trust, Ltd.**—The report for the 18 months ended September 29 last shows that revenue amounted to £70,825, equivalent to £47,216 per annum. The net profit was £69,025, against £41,069, for the year ended March 31, 1933; of this, £16,619, against £10,269, is absorbed by income-tax. The dividend on the six per cent. preference shares takes £31,735, and £10,000, against £5,000, is placed to reserve, leaving £2,793 to go forward, against £2,122 brought in. The directors state that although in certain areas the shops of the company's subsidiaries served more customers, in most areas actual sales of comparable shops are slightly down, and the increased profit shown is the result of internal economies, etc.

**United Molasses Co.**—Total consolidated profits of the United Molasses Co. and its subsidiary companies for the year to September 30, 1934, were £651,531, after providing for all foreign taxes, and it is stated that adequate statutory carry-forwards are available to meet British income-tax liability arising out of the year's trading profit. The total net profit, after allowing for depreciation, is £367,725, and an amount of £23,780 left as undistributed profits in subsidiary companies, accounts for the difference between this £367,725 and the net profits of £343,945, shown in the profit and loss account of the company. A dividend of 6 per cent., less tax, will be paid on the ordinary shares, and £4,000 is contributed to staff funds. The annual meeting will be held at Bush House, London, on December 19, at 12.30 p.m.

**Turner and Newall, Ltd.**—The net trading profits of the year to September 30, 1934, subject to audit (after providing for depreciation, directors' fees, and provision for taxation) amount to £714,228. This shows an increase compared with the previous year of £307,572. A final ordinary dividend of 7½ per cent. is proposed, making 10 per cent. for the year, compared with 5 per cent. in 1932-1933, when the final was 3½ per cent. In addition, the directors recommend that £94,349 be appropriated against the book value of subsidiary companies' assets conveyed to Turner and Newall, Ltd. This appropriation, it is pointed out, is instead of allocating £100,000 to general reserve. After crediting staff fund with £10,000, a surplus of £130,513 is carried forward, compared with £106,126 brought in.

**Low Temperature Carbonisation, Ltd.**—The company announces its first ordinary dividend, which is at the rate of 3 per cent. on the whole of the issued capital, including the £300,000 of additional stock issued this year, but which has not yet reached the earning stage.

**Celanese Corporation of America.**—A dividend of \$1.75 per share is announced on the 7 per cent. cumulative series prior preferred stock, payable on January 1, and a payment of \$3.50 per share on the 7 per cent. cumulative first participating preferred stock on December 31.

**Taylors Drug Co.**—Trading profits of the Taylors Drug Co., which is controlled by Taylors (Cash Chemists) Trust, rose from £59,993 in 1932-33 to £79,272 in the year ended September 29 last. After charging debenture interest, £14,177, against nil, and providing for depreciation and income-tax the net balance remaining was £7,556 higher at £42,780. The directors have written off £5,219 from debenture discount, etc., and they recommend a final dividend of 4 per cent., tax free, on the ordinary shares, making 7 per cent., tax free, for the year, against 6½ per cent., which will leave the "carry forward" virtually unchanged at £24,712. Since the last financial year the company has opened 11 new branches.

**Taylors (Cash Chemists) London, Ltd.**—The accounts for the year ended September 29 show a gross profit of £48,929, against £47,326 for 1932-33, out of which £10,903, against £9,014, has been provided for income-tax and £6,164, against £10,119, has been set aside for depreciation, etc., leaving £31,862, against £28,193. Preference dividends absorb £17,156 and interest on the funding certificates takes £2,842. No distribution is recommended on the preferred or deferred ordinary shares, but £10,000 is again to be transferred to reserve and £6,106 is to be carried forward, against £4,242 brought into the accounts, after writing off expenses amounting to £1,591 incurred in connection with the capital rearrangement scheme carried through at the beginning of this year. Excluding interests in subsidiary and associated companies, floating assets total £170,700, against current liabilities of only £13,583.

## New Companies Registered

**Auxiliary Products and Chemicals (Leeds), Ltd.**—Registered November 21. Nominal capital, £2,000. Manufacturers of and dealers in all kinds of chemicals (organic and inorganic), acids, salts, oils, dyes, soaps, drugs, fertilisers, gases, glues, gums, etc. Directors: Stanley M. H. Rimmell, Graylands, Roundhay, Leeds; Chas. H. Plackett.

**Bovril (S.E.), Ltd.**—Registered November 20, in Dublin. Nominal capital, £40,000 in 40,000 ordinary shares of 5s., and 30,000 preference shares of £1 each. Manufacturers, exporters and importers of animal, vegetable, or other substances (separately or in combination) for use as food, and also of meat foods, extracts and products, etc. Directors: John Sheridan, Stewart P. Dormer, Earl of Longford and Edward Sheridan.

**Pinene Ozonide, Ltd.**, 4 Half Moon Street, Piccadilly, W.1.—Registered November 28. Nominal capital £1,000. To acquire the business of manufacturing and exploiting apparatus for creating and producing Gaseous Pinene Ozonide and other vapours from the air carried on by Thos. T. Reeves, at 441 Watford Way, Hendon, N.W.4. Directors: Thos. T. Reeves, Denham E. Rodwell.

**The Institute of Trade Mark Agents, Ltd.**, 69 Cannon Street, E.C.4.—Registered on November 24, as a company limited by guarantee, without share capital, with 100 members, each liable for not more than £1 in the event of winding up. The objects are to protect the interests of all companies, firms and persons engaged in the profession of trade mark agents; to protect the interests of all proprietors of trade marks, etc. The management is vested in a Council, the provisional members of which are: Reginald Barker, Algernon R. Carpenter, C. W. Wade, Walter Bray, Sir William S. Jarratt.

## Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

**France.**—An agent established at Paris wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of activated charcoal for clarification of oil, wine, etc., and for deodorisation and absorption of various gases. (Ref. No. 503.)

### Other Inquiries

**Chemical Plant.**—A manufacturer inquires for details, names of manufacturers, and approximate cost of erection, of a plant for converting neutral silicate of soda in lumps into silicate of soda liquid, 84 deg. Tw. The plant is required to deal with about fifty tons of lump material per week. (Information to the Editor, THE CHEMICAL AGE, Ref. 806.)

## Forthcoming Events

### LONDON.

- Dec. 10.**—Institution of the Rubber Industry (London Section). Annual general meeting. 7.30 p.m. 12 St. James's Square.  
**Dec. 11.**—Pharmaceutical Society of Great Britain. "Dosage above the Pharmacopoeial Maximum." A. F. Hurst. 8.30 p.m. 17 Bloomsbury Square, London.  
**Dec. 12.**—Society of Chemical Industry (Plastics Group) (Road and Building Materials Group) and the Institution of County and Municipal Engineers. "Tar and Asphalt for the Surface Dressing of Roads." A. C. Hughes. 7.30 p.m. Burlington House, Piccadilly, London.  
**Dec. 12.**—Society of Glass Technology. 2 p.m. Burlington House, London.  
**Dec. 13.**—Oil and Colour Chemists' Association. "Paint and Varnish Problems in Aeronautics." Dr. E. W. J. Mardles. 30 Russell Square, London.  
**Dec. 14.**—Chemical Engineering Group. "The Chemical Aspect of Timber Research." W. G. Campbell. 8 p.m. Burlington House, Piccadilly, London.

### BIRMINGHAM.

- Dec. 13.**—Society of Chemical Industry (Birmingham and Midland Section). "Applications of Chemistry in Modern Agriculture." Sir E. John Russell. 7.30 p.m. University Buildings, Edmund Street, Birmingham.

### BRADFORD.

- Dec. 10.**—Society of Dyers and Colourists (Bradford Junior Branch). "The Dyeing of Hat Materials." Dr. T. A. Forster.  
**Dec. 13.**—Society of Dyers and Colourists (West Riding Section). "Water for Dyeing." A. H. Waddington and R. Clark (The Paterson Engineering Co., Ltd.). Bradford.

### BRISTOL.

- Dec. 10.**—Society of Chemical Industry (Bristol Section). Joint meeting with the Bristol and South Western Counties Section of the Institute of Chemistry. "Chemical Defence." Dr. H. Levinstein. 5.30 p.m. University Chemical Department, Woodland Road, Bristol.

### GLASGOW.

- Dec. 10.**—Institute of Metals (Scottish Section). "Improvements in Surface Condenser Tubes." A. Spittle. 7.30 p.m. 39 Elmbank Crescent, Glasgow.  
**Dec. 12.**—The Alchemists Club. "The Biogenesis of Alkaloids." Professor G. Barger. 7.30 p.m. University, Glasgow.

### HUDDERSFIELD.

- Dec. 11.**—Institute of Chemistry (Huddersfield Section). "Research." Dr. L. H. Lampitt.

### HULL.

- Dec. 14.**—Hull Chemical and Engineering Society. Dinner Dance at Powolny's, King Edward Street, Hull.

### LANCASTER.

- Dec. 13.**—Lancastrian Frankland Society. "Nervous Control—Chemical or Physical." Dr. H. R. Ing.

### LEEDS.

- Dec. 10.**—Society of Chemical Industry (Yorkshire Section). "Some Problems of Water Supply." A. Parker. 7.15 p.m. University, Leeds.  
**Dec. 13.**—Institute of Brewing (Yorkshire and N.E. Section). "Malting Practice." Queen's Hotel, Leeds.

### LEICESTER.

- Dec. 12.**—Society of Dyers and Colourists (Midlands Section). "Peroxide Bleaching." I. E. Weber. Leicester.

### LIVERPOOL.

- Dec. 15.**—Liverpool Chemistry Dinner. 7.30 p.m. Adelphi Hotel, Liverpool.

### MANCHESTER.

- Dec. 10.**—Institution of the Rubber Industry (Manchester Section). Papers on "Proofing." 7 p.m. Engineers' Club.

- Dec. 12.**—Institute of Fuel (N. Western Section). Film evening. Films of various processes and appliances in connection with fuel production and use will be shown. 7 p.m. Engineers' Club, Albert Square, Manchester.

- Dec. 13.**—Institute of Brewing (North of England Section). "The Foundations of Brewing." Dr. L. H. Lampitt. Midland Hotel, Manchester.

- Dec. 14.**—Society of Dyers and Colourists (Manchester Section). "The Dyestuffs Industry." Major F. A. Freeth. (Joint meeting with the Chemical Section of the Manchester Literary and Philosophical Society.) 7 p.m. 36 George Street.

### NEWCASTLE-ON-TYNE.

- Dec. 15.**—Institute of Metals (N.E. Coast Section). "Problems in Non-Ferrous Foundry Practice." F. W. Rowe. 7.30 p.m. Armstrong College, Newcastle-on-Tyne.

### SHEFFIELD.

- Dec. 14.**—Institute of Metals (Sheffield Section). "Rhodium Plating and Its Applications." A. W. Scott. 7.30 p.m. University, St. George's Square, Sheffield.

### SWANSEA.

- Dec. 11.**—Institute of Metals (Swansea Section). "Refractory Materials of South Wales." Professor W. R. D. Jones. 6.15 p.m. Y.M.C.A., Swansea.

- Dec. 16.**—Swansea Technical College Metallurgical Society. "Tinplate—Some Fundamental Considerations." W. E. Hoare. 6.45 p.m. Technical College, Swansea.

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Application forms (returnable 20th December, 1934) and particulars of the Associate-Membership Examination for 1935, together with the Memorandum on "The Training of a Chemical Engineer," may be obtained from the Hon. Registrar, Institution of Chemical Engineers, Abbey House, Westminster, London, S.W.1.

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#### PATENTS AND DESIGNS ACTS, 1907 TO 1932.

**N**OTICE is hereby given that Eberhard Momma, of 213 Keizergracht, Amsterdam, Holland, seeks leave to amend the Complete Specification of Letters Patent No. 411,430 granted to him for an invention entitled "Improvements in or relating to the production of liquid chlorothymols and chlorocarvacrols."

Particulars of the proposed amendment were set forth in No. 2,393 of the Official Journal (Patents), published on November 28, 1934.

Any person, or persons, may give Notice of Opposition to the amendment by leaving Patents Form No. 19 at the Patent Office, 25 Southampton Buildings, London, W.C.2, within one calendar month from the date of publication of the said Journal.

M. F. LINDLEY,  
Comptroller-General.

**T**HE proprietor of British Patent No. 357,658, dated July 2, 1930, relating to "Thermometers," is desirous of entering into arrangements by way of a licence or otherwise on reasonable terms for the purpose of exploiting the above patent and ensuring its practical working in Great Britain. Inquiries to B. Singer, Steger Building, Chicago, Illinois.

